

cm. wide, thinner in texture, and not matted-tomentose beneath.

The type of the variety was collected by Leonard John Brass (no. 17719) occasional in rainforest regrowths, at 1200 meters altitude, on Cholo Mountain, Cholo district, Nyasaland, on September 21, 1946, and is deposited in the Britton Herbarium at the New York Botanical Garden.

MATERIALS TOWARD A MONOGRAPH OF THE GENUS LIPPIA. VII

Harold N. Moldenke

LIPP

IA PUMILA Cham.

Additional bibliography: Moldenke, Lilloa 5: 429. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 37 & 96. 1942; Moldenke, Phytologia 2: 385. 1947; Moldenke, Lilloa 14: 46. 1948; Moldenke, Alph. List Cit. 2: 368, 370, 552, & 553 (1948), 3: 695, 848, & 921 (1949), and 4: 1250 & 1300. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 81 & 190. 1949; Moldenke, Phytologia 3: 74. 1949; Stellfeld, Trib. Farmac. 19 (10): 169. 1951; Angely, Fl. Paran. 7: 12. 1957; Moldenke, Résumé 94 & 462. 1959; Angely, Fl. Paran. 16: 60 (1960) and 17: 46. 1961; Moldenke, Phytologia 12: 24, 90, & 221. 1965.

Perennial herb, viscid-pubescent and softly villosulous-hirtellous throughout; rhizome creeping, woody; stems herbaceous, simple, erect, rather terete, about 20 cm. tall; leaves decussate-opposite or ternate, sessile, ovate or elliptic, crenate-serrate along the margins from the middle to the apex, venose, the lowest ones smallest, the following ones larger and mostly obtuse at the apex, the upper ones perfectly formed, about 1.8 cm. long and 1 cm. wide, acute at the apex; inflorescences in the upper leaf-axils; peduncles solitary, filiform, erect, twice as long as the leaves; heads hemispheric, many-flowered, 1 cm. wide; bractlets lanceolate, acute at the apex, very smooth on the inner surface, equaling the corolla-tube, those of the involucre slightly larger; corolla hypocrateriform, yellow, about 4 mm. long, pubescent on the outside, villosulous toward the throat inside, the limb rather large, oblique, shiny, the lobes obtuse at the apex, the lateral ones retuse at the apex.

The type of this species was collected by Friedrich Sellow somewhere "In Brasilia meridionali" and is deposited in the herbarium of the Naturhistorisches Museum at Vienna, where it was photographed by Macbride as his type photograph number 34332. Schauer (1847) places the species in his Section Zapania, Subsection Axiliflorae. It has been found growing on campos, sandy and burned-over campos, at 875 meters altitude, flowering in March, August, October, and November. Material has been misidentified and distributed in herbaria as L. asperrima Cham. and L. intermedia Cham. On the other hand, the Kuntze s.n. [Stud Paraguay, IX.92], distributed

as L. pumila, is L. tegulifera Briq. The Bahia record given for L. pumila by me in previous publications was based on Hertel 6, but this collection proves to have come from Vila Velha in Paraná, not from Bahia.

In all, 9 herbarium specimens and 9 mounted photographs, including phototype material, have been examined by me.

Citations: BRAZIL: Matto Grosso: Hoehne & Gehrt s.n. [Campo Grande, Aug. 6, 1936] (Sp--35785, Sp). Paraná: Dusén 16736 (F--photo, N--photo, S, Si--photo, Z--photo), s.n. [Vila Velha, 13.3.1904] (S), s.n. [Desvio Ribas, 15.3.1904] (S); Hertel 6 [Herb. Jard. Bot. Rio de Jan. 50530] (N); F. C. Hoehne s.n. [Vila Velha, Ponta Grossa, Nov. 3, 1928] (N, Sp--23346). State undetermined: Reinhardt s.n. (Cp, N--photo, Z--photo); Sellow s.n. [Macbride photos 34332] (It--photo of tupe, Kr--photo of type, N--photo of type).

LIPPIA RADULA J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 279. 1900.

Synonymy: Lippia rodula Baker ex Cuf., Bull. Jard. Bot. Brux. 32: Suppl. 791, sphalm. 1962.

Bibliography: J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 279. 1900; K. Schum. in Just, Bot. Jahresber. 28 (1): 496. 1902; Thiselt.-Dyer, Ind. Kew. Suppl. 2: 106. 1904; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 50 & 96. 1942; Moldenke, Phytologia 2: 482. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 110, 118, & 190. 1949; Moldenke, Résumé 135, 146, & 462. 1959; Cuf., Bull. Jard. Bot. Brux. 32: Suppl. 791. 1962; Moldenke, Phytologia 12: 42, 106, 177, 230, 307, & 352. 1965; Moldenke, Résumé Suppl. 12: 5, 6, & 10. 1965.

Undershrub, 1 or more m. tall; stems stout, short-pubescent, not branched below the inflorescence; leaves ternate, sessile, oblong, distinctly crenate along the margins, rigidly coriaceous, very scabrous on the upper surface, densely pubescent, the lower ones 7.5--10 cm. long and 4--5 cm. wide, the venation prominent beneath; heads oblong or ovate, about 1.5 cm. long, a few aggregate at the ends of long stiff ascending peduncles, forming an ample terminal panicle; bractlets closely imbricate, orbicular, very hairy, not cuspidate at the apex, the outer ones about 4 mm. wide; flowers scarcely surpassing the bractlets.

The type of this species was collected by Georg August Schweinfurth (no. 2616) on the Sabbi River, in the Bongo region, Kenya, on November 24, 1869. The species is known thus far to me only from the type collection. The specific name is often uppercased. Material has been misidentified and distributed in herbaria as Lantana sp. On the other hand, the E. Brown 84, distributed as L. radula, is actually L. grandifolia Hochst. The record of this species from Abyssinia by me in previous publications is an error. It is not known as yet from outside of Kenya.

Baker (1900) separates the 8 tropical African species known to him as follows:

1. Bractlets orbicular, obtuse at the apex.

2. Peduncles very short.....L. oatesii.
 2a. Peduncles elongate.....L. radula.
 1a. Bractlets cuspidate at the apex.
 3. Leaves small.
 4. Leaves orbicular to obovate.....L. somalensis.
 4a. Leaves oblong, rugosa.....L. javanica.
 3a. Leaves larger, oblong or oblanceolate-oblong, scarcely
 rugose.....L. abyssinica.
 1b. Bractlets acuminate.
 5. Leaves opposite.....L. ukambensis.
 5a. Leaves ternate.....L. burtonii.
 1c. Bractlets acute at the apex.....L. plicata.

In all, 2 herbarium specimens and 4 mounted photographs of the type collection have been examined by me.

Citations: KENYA: Schweinfurth 2616 (F--photo of isotype, N--isotype, N--photo of isotype, S--isotype, Si--photo of isotype, Z--photo of isotype).

LIPPIA RAMBOI Moldenke, Lloydia 13: 223--224. 1950.

Bibliography: Moldenke, Lloydia 13: 223--224. 1950; Moldenke, Phytologia 3: 376. 1950; E. J. Salisb., Ind. Kew. Suppl. 11: 138. 1953; Moldenke, Inform. Mold. Set 48 Spec. [3]. 1954; Rambo, Sellowia 7: 260, 281, & 288. 1956; Moldenke, Résumé 94 & 462. 1959.

Virgate or divaricately branched shrub, to 3 m. tall; branchlets and twigs slender, stramineous, obtusely tetragonal, strigillose on two opposite sides, glabrate on the two other sides; nodes annulate; principal internodes 2.5--5 cm. long; leaves decussate-opposite; petioles slender, 2--4 mm. long, glabrous; leaf-blades firmly chartaceous, grayish-green above, lighter beneath, elliptic or elliptic-obovate, acute at the apex, cuneate-attenuate or acuminate at the base, serrate from about the middle to the apex, pilosulous-scabrellous with bulbous-based hairs above, subglabrous but densely punctate beneath, occasionally with a few scattered short white hairs on the venation; midrib slender, subimpressed above, sharply prominent beneath; secondaries very slender, 2--5 per side, subimpressed above, sharply prominent beneath; veinlet reticulation indiscernible above or the largest parts subimpressed, plainly visible but not at all elevated beneath; inflorescence axillary, subcapitate-spicate, 2 per node, abundant, shorter than the subtending leaves; peduncles rather stoutish, tetragonal-angular, 13--20 mm. long, subglabrate or minutely puberulous on 2 opposite sides; spikes very densely subcapitate, to 1 cm. long and 1.5 cm. wide; bractlets large, foliaceous, conspicuous, the lowest ones elliptic, to 8 mm. long and 4 mm. wide, firmly chartaceous, obtuse at the apex, strigillose-scabrellous above and punctate beneath like the leaves, the upper ones smaller and more conspicuously appressed-strigillose on the back; calyx about 2.8 mm. long, densely hirsutulous-pubescent, plainly lobed; corolla about 5 mm. long, densely strigose on the outside, its limb very short.

The type of this distinctive species was collected by my good

friend and colleague, Padre Balduin Rambo (no. 46306) — in whose honor it was named — in an Araucaria grove at São Francisco de Paulo, Rio Grande do Sul, Brazil, on March 13, 1950, and is deposited in the Britton Herbarium at the New York Botanical Garden. The collector states that it seems to be a very rare species in Rio Grande do Sul. It was also collected by Padre Buck (no. 11569) at Fazenda Englert near the type locality in January, 1944, the specimen deposited in the herbarium of the Colegio Anchieta at Porto Alegre. This type locality should not be confused with that of the same name on Sellow's labels, which is actually the modern Pelotas near the southeast coast of Rio Grande do Sul. It is on the southern border of the southern Brazilian highlands, 900 meters above sealevel and 120 km. north-northeast of Porto Alegre, about 29° S. latitude and 51° W. longitude. The locality of 11569 is about 50 km. away from São Francisco to the northeast. The range of the species seems to be confined to Araucaria forests with 14--16° middle temperature, 1750--2000 mm. rainfall, and occasional snowfall in July and August.

In all, 12 herbarium specimens, including the type, have been examined by me.

Citations: BRAZIL: Rio Grande do Sul: Rambo 46306 (N--type, S--isotype), 52156 (B, B, Le, Le, N, S, W--2102353, Z), 54583 (B); Sehnem 5870 (B).

LIPPIA RECOLLETAE Morong in Morong, Britton, & Vail, Ann. N. Y. Acad. Sci. 7: 196--197. 1892.

Synonymy: Lippia recolectae Morong apud Chod., Bull. Herb. Boiss., sér. 2, 2: 820, sphalm. 1902. Lippia recolectae var. balansae Chod., Bull. Herb. Boiss., sér. 2, 2: 820. 1902. Lippia recolectae Morong apud Briq., Arkiv. Bot. Stockh. 2 (10): 19, sphalm. 1904. Lippia recolectae var. balansae Chod. ex Moldenke, Résumé 117 & 462. 1959.

Bibliography: Morong, Britton, & Vail, Ann. N. Y. Acad. Sci. 7: 196--197. 1892; Kuntze, Rev. Gen. Pl. 3 (2): 253. 1898; Chod., Pl. Hassler. 1 (9): 199. 1902; Chod., Bull. Herb. Boiss., sér. 2, 2: 820. 1902; Durand & Jacks., Ind. Kew. Suppl. 1: 250. 1903; Briq., Arkiv Bot. Stockh. 2 (10): 19. 1904; Briq., Ann. Conserv. & Jard. Bot. Genève. 7-8: 315--316. 1904; Briq. in Chod. & Hassler, Pl. Hassler. 2 (11): 492. 1904; Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1156. 1904; Moldenke, Alph. List Common Names 20. 1939; Moldenke, Lilloa 5: 425--426. 1940; Moldenke, Suppl. List Invalid Names 6. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 41, 43, & 96. 1942; Moldenke, Alph. List Invalid Names 32. 1942; Moldenke, Phytologia 2: 78 & 107. 1945; Moldenke, Lilloa 11: 206. 1945; Moldenke, Alph. List Cit. 1: 12, 262, & 266. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 15. 1947; Moldenke, Alph. List Cit. 2: 440, 441, 444, 600, & 628. 1948; Moldenke, Castanea 13: 118. 1948; Moldenke, Lilloa 14: 44--45. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 99, 105, & 190. 1949; Moldenke, Alph. List Cit. 3: 665, 666, 705, 749, 772,

781, & 865 (1949) and 4: 1237 & 1257. 1949; Moldenke, *Phytologia* 3: 289. 1950; Moldenke, *Résumé* 117, 125, 316, & 462. 1959; Moldenke, *Résumé Suppl.* 3: 33 (1962) and 12: 5. 1965; Moldenke, *Phytologia* 12: 63, 90, 233, & 297. 1965.

A perennial herb, suffruticose, or a subshrub or small shrub, to 0.6 m. tall, with a woody enlarged tuberous taproot; stems nearly simple or with 1 or 2 long branches from near the base, terete below, tetragonal and deeply grooved above, densely papillose-hispid, 3--6 dm. tall, arising from thick ligneous roots; leaves decussate-opposite, petiolate, with a rank odor; petioles 5--15 mm. long; leaf-blades ovate or lanceolate-ovate, 3--7 cm. long, 1.5--2.5 cm. wide, acute or obtuse at the apex, strongly crenate-serrate along the margins, attenuate into the petiole at the base, densely hispid on both surfaces, scarcely penninerved, the secondaries about 7 per side; peduncles 3--5 mm. long, hispid; flowers in dense globular or ovate heads, the heads axillary, solitary; bractlets imbricate, about 4 mm. long, 2--3 mm. wide, cuspidate-acuminate at the apex, densely hirsute-ciliate and hispid, nearly hiding the flowers; calyx membranous, compressed, bifid, puberulent, splitting and falling off with the seeds at maturity; corolla hypocrateriform, varying from yellow or pale-yellow to cream-white or white, sometimes white with a yellow throat, ampliate, 2-lipped, the upper lip entire, the lower lip 3-lobed, downy on either side under the lobes, about 3 mm. long, only the lobes showing under the acumen of the subtending bractlets; seeds flattened-globose, about 1.5 mm. long, pubescent, splitting at maturity into two hemispheric nutlets.

The type of this very distinct species was collected by Thomas Morong (no. 62) in the neighborhood of Recolleta, a well-known cemetery about two miles from Asuncion, Paraguay, where the collector states that the species abounds. He says that the plant has a strong mint-like odor and flowers in October and November. It is obviously rather closely related to L. suffruticosa (Griseb.) Kuntze.

The original description of the species is sometimes cited as "Morong Enum. pl. coll. Parag. 196" or "Morong, Paraguay (1892) 196" and dated "1893". The species has been found growing in shrubbery, grasslands, and pastures with Solidago, etc., on hard exposed or sandy soil, high campos, in open dry pastures, and along roadsides, flowering in March, April, and from June to December, fruiting in March, August, and December. Jørgensen calls it "very common in the campo" and "abundant" in Paraguay. A vernacular name recorded for it is "malvena".

The flowers are described as "yellow" on Ibarrola 3551, Jørgensen 3776, Kuntze s.n., & Pedersen 4347, as "white" on Malme s.n. & Rodríguez 234, as "white with yellow throat" on Archer 4667 and Lindman A.2313, as "cream-white" on Herb. Hicken 190, Herb. Osten 7536, and T. Rojas s.n., and as "pale-yellow" on Herb. Osten 22238 and Jørgensen 3776.

Material has been misidentified and distributed in herbaria un-

der the names L. asperifolia Rich., L. geminata H.B.K., L. morongii Britton, and L. suffruticosa (Griseb.) Kuntze. On the other hand, the Herb. Osten 11918 and Jørgensen 2631, distributed as L. recolletae, are actually L. asperrima Cham.

Briquet (1904) cites Hassler 1041 from "L'Assomption, dans les champs incultés, avril 1874, fleurs d'un blanc jaunâtre" and 1041a from "Caaguazu, dans les campos, 12 novembre 1874", commenting that "Le n. 1041 est distingué par M. Chodat.....comme var. Balansae, en suggérant subitativement qu'elle pourrait constituer une espèce nouvelle. Nous ne pouvons voir dans ce numéro qu'un échantillon un peu plus robuste, à feuilles un peu plus grandes et plus fortement dentées. Les plus grandes feuilles du n. 1041 ont un limbe qui mesure 7.4 cm. de surface, celles du 1041a bis atteignent 9.5 cm. Ces différences, d'ailleurs purement qualitatives, sont certainement d'ordre individuel."

In all, 52 herbarium specimens, including type material of most of the names involved, have been examined by me.

Citations: BOLIVIA: Cochabamba: Adolfo "D" (Z). PARAGUAY: C. Alvarez s.n. [Asuncion, 1954] (Je-8717); Andeer s.n. (W-2383969); Archer 4667 (N, W-1705490); Hassler 944 (N), 11040 (N), 11583 (Ca-930200, N, S, W-1056988); Hauthal 29 (N); Jørgensen 3776 [Herb. Osten 22238] (Du-197834, N, S, Ug, W-1483918), s.n. [Herb. Mus. Argent. Cienc. Nat. 28/2068] (N); Kuntze s.n. [Stud-Paraguay, IX.92] (N, W-701018); Lindman A.2219 1/2 (S), A.2313 (S), A.3903 (N, S); Malme s.n. [Asuncion, July 17, 1893] (S); Morong 62 (Mi-isotype, W-1322974-isotype); Osten 9012 (S, Ug); Edw. Palmer s.n. [1853--6] (W-41092); Pedersen 4347 (N, S, W-2283782); D. Rodriguez s.n. [Herb. Mus. Argent. Cienc. Nat. 23837] (N); T. Rojas s.n. [San Bernardino, June 1915; Herb. Hicken 190; Herb. Osten 7536] (Ug); Wunderli 40 (Pm). ARGENTINA: Corrientes: Ibarrola 3551 (N, S); Pedersen 1163 (W-2141500). Misiones: Bertoni 2552 (N); Ekman 2007 (Mi, N, S), 2008 (N, S); Grüner 597 [Herb. Osten 23175] (Ug); Montes 1979 (N); Niederlein 1476 [Herb. Mus. Nac. Hist. Nat. Buenos Aires 23601] (Ra); D. Rodriguez 234 [Herb. Inst. Miguel Lillo 32056] (Ca-3492, N, W-1802575, W-1858272).

LIPPIA REHMANNI H. H. W. Pearson in Thiselt.-Dyer, Fl. Cap. 5 (1): 196--197. 1901.

Synonymy: Lippia bazeiana H. H. W. Pearson in Thiselt.-Dyer, Fl. Cap. 5 (1): 197. 1901. Lantana bazeiana H. H. W. Pearson ex Moldenke, Alph. List Invalid Names 28, in syn. 1942. Lantana rehmanni H. H. W. Pearson ex Moldenke, Alph. List Invalid Names 28, in syn. 1942. Lippia rehmanni H. H. W. Pearson ex Moldenke, Résumé 316, in syn. 1959. Lippia baurii H. H. W. Pearson ex Moldenke, Résumé Suppl. 12: 10, in syn. 1965.

Bibliography: H. H. W. Pearson in Thiselt.-Dyer, Fl. Cap. 5 (1): 196--197. 1901; A. W. Hill, Ind. Kew. Suppl. 6: 117. 1926; Molden-

ke, Known Geogr. Distrib. Verbenac., [ed. 1], 52, 95, & 96. 1942; Moldenke, Alph. List Invalid Names 28 & 29. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 78. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 122, 189, & 190. 1949; Moldenke, Phytologia 3: 456 & 458 (1951) and 5: 26. 1954; Barton & de Mayo, Journ. Chem. Soc. Lond. 1954 (3): 887--900. 1954; Specter, Handb. Biolog. Data 432. 1956; Moldenke, Inform. Mold. Set 51 Spec. 3. 1956; Barton & de Mayo, Biol. Abstr. 30: 4066. 1956; Moldenke, Résumé 142, 152, 154, 303, 307, 310, 316, & 462. 1959; Kingsbury, Poison. Pl. 295 & 610. 1964; Moldenke, Phytologia 12: 231, 232, & 358. 1965; Moldenke, Résumé Suppl. 12: 10. 1965.

Herb, low undershrub, or small erect shrub, 0.5--1.1 m. tall, much branched from the base and above; adult stems tetragonal or terete, striate, scabrid-puberulent or scabrid-pubescent to pubescent, with rounded angles, often glandulose; principal internodes 2.5--5 cm. long; leaves decussate-opposite, sessile or short-petiolate; leaf-blades ovate or elliptic, 2.5--5.5 cm. long, 1--2.5 cm. wide, acute or obtuse at the apex, cuneate at the base, with crenate-serrate or coarsely serrate slightly recurved margins, rugose or slightly so, scabrid or scabrid-pubescent above and on the venation beneath, glandular-punctate; secondaries 4 or 5 per side, ascending, impressed above, prominent beneath; peduncles terete for the lower $\frac{3}{4}$, dilated and tetragonal above, or angular and 4-grooved, 0.8--5 cm. long, scabrid-puberulous or pubescent; spikes globose to cylindric or ovoid-cylindric in fruit, solitary, with a pubescent rachis, to 1.6 cm. long and 6--8 mm. wide; bractlets broadly ovate or ovate to obovate, subacuminate or shortly acuminate to caudate-acuminate at the apex, 3--6 mm. long, 2 mm. wide, equaling or slightly surpassing the flowers, 3-veined, densely pubescent and often profusely glandulose; calyx compressed, 1--2 mm. long, distinctly veined, densely pubescent or appressed-pubescent outside, glabrous within, the rim subtruncate or subbilobed with 2 very short rounded lobes; corolla hypocrateriform, white or cream-colored, pubescent outside, puberulent within or pubescent only above the middle within, its tube 3--4 mm. long, 1--1.25 mm. wide, hairy above, the anterior lobe broad, entire or subemarginate, the posterior one sinuate, smaller than the anterior one, the middle lobe of the lower lip 1 mm. wide; stamens in 2 series; anthers 0.5 mm. long; style 1--1.25 mm. long or the ovary and style together about 2 mm. long; ovary glabrous; seeds semiglobose, shortly oblong, or shortly obovoid, plano-convex, flattened at the commissure, 1--1.5 mm. long, 0.5--1 mm. wide, glabrous, smooth.

The type of this species was collected by A. Rehmann (no. 4259) in the hills above the Aapies River, Transvaal, South Africa. The type of L. bazeiana and of L. baurii was collected by Rev. Leopold Richard Baur (no. 462) at Bazeia, at an altitude of 2000 feet, Tembuland, Cape of Good Hope, South Africa. The leaves contain an essential oil which smells of limonene. The plant also produces icterogenin, $C_{34}H_{52}O_6$, a photodynamic agent with a toxic photosensitization effect, causing "yellow thick head" in sheep.

Meeuse 9414 is said to represent a shade form of the species.

The species has been found growing on rocky hillsides, in dry Acacia sand veld, in undergrowth of mixed bush, and especially along roadsides, flowering in January, April, and December, and fruiting in April.

Pearson (1901) distinguishes this species from related South African species as follows:

1. Calyx distinctly 2-lobed.
 2. Bractlets more than 4 mm. long and 3 mm. wide, surpassing the flowers.....L. scaberrima.
 - 2a. Bractlets less than 4 mm. long and 3 mm. wide, not surpassing the flowers.....L. javanica.
- 1a. Calyx truncate, subtruncate, or obscurely lobed.
 3. Leaf-blades serrate or crenate-serrate.
 4. Bractlets more than 4 mm. long; calyx truncate or obscurely 4-toothed.....L. wilmsii.
 - 4a. Bractlets less than 4 mm. long; calyx obscurely 2-lobed.....L. rehmanni.
 - 3a. Leaf-blades crenate.....L. pretoriensis.

Meeuse, in a letter to me, dated September 28, 1953, says: "The family Verbenaceae does not seem to offer many difficulties apart from the genus Lippia. I am inclined to believe that Pearson's L. rehmanni, L. wilmsii, L. bazeiana and L. pretoriensis can hardly be different from 'L. asperifolia' (= L. javanica)." In a letter dated December 9, 1953, he says "The Lippia material is extremely variable and some of Pearson's species definitely must be sunk. His calyx-character (distinctly lobed or indistinctly lobed to truncate) is useless, to my mind, so that L. wilmsii cannot on very good grounds be separated from L. scaberrima, and the three L. rehmanni-bazeiana-pretoriensis are also very close." The H. Lang s.n. [Herb. Transvaal Mus. 32208], distributed as L. rehmanni, is actually L. wilmsii H. H. W. Pearson.

In all, 17 herbarium specimens, including type material of all the names involved, and 3 mounted photographs have been examined by me.

Citations: CONGO LEOPOLDVILLE: Bredo 5576 (Br, N). SWAZILAND: M. Stewart s.n. [Herb. Transvaal Mus. 8963] (Af). SOUTH AFRICA: Cape of Good Hope: Baur 462 (Af, N—photo, N—photo). Transvaal: Chippindall 137 (Af); L. E. Codd 1132 (Ss); T. J. Jenkins s.n. [Herb. Transvaal Mus. 6758] (Af); Meeuse 9414 (Ss), 9543 (Ss); Mes s.n. [I.1917] (N); Rehmann 4259 (Af—isotype, N—photo of isotype); Schweickerdt 1096 (Af, Z), 1222 (S), 1299 (S); I. C. Verdoorn 579 (Af); Wasserfall & Niekerk 15, in part (Af).

LIPPIA RETICULATA Hayek in Fedde, Repert. Nov. Sp. 2: 87. 1906.

Bibliography: Hayek in Fedde, Repert. Nov. Sp. 2: 87. 1906; Prain, Ind. Kew. Suppl. 4: 142. 1913; A. B. Seymour, Host Ind. Fungi N. Am. 588. 1929; Moldenke, Known Geogr. Distrib. Verbenac.,

[ed. 1], 37 & 96. 1942; Moldenke, Alph. List Cit. 1: 223 (1946) and 3: 693. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 81 & 190. 1949; Moldenke, Résumé 94 & 462. 1959; Moldenke, Phytologia 12: 153, 200, & 274. 1965.

Branchlets elongate, ferruginous, velutinous with very short spreading hairs, finally glabrate; leaves decussate-opposite, sessile, ovate-orbicular, 1.5--3 cm. long, subacute or obtuse at the apex, broadly cuneate or truncate at the base, often shorter than the internodes, dentate along the margins, almost plane above or with the veins slightly impressed, smooth and slightly glandular-pilose beneath, the venation reticulate and glandular-velutinous; peduncles axillary, solitary in the axils of the uppermost leaves at the apex of the branchlets, subequaling the subtending leaves; heads ovate, 1.5--2 cm. long; bractlets 6--7 mm. long, almost orbicular, membranous, with elevated veins, hirsute; corolla hypocrateriform, scarcely surpassing the subtending bractlet, hirsute.

This little-known species was based by Hayek on two collections made by George Gardner under the number 2940, one from Piauí and the other from Pernambuco, Brazil, the former photographed by Macbride in the Delessert Herbarium at Geneva as his type photograph number 24664. Hayek (1906) says: "Differt a L. elliptica Schauer foliis multo minoribus latioribusque indumento alieno, capitulis minoribus brevius petiolatis bracteis hirsutis, a L. hederifolia Mart. foliis subtus reticulato-nervosis pilosis bracteis hirsutis, a L. marrubiiifolia Reichardt foliis supra non velutinis dentatis nec crenatis capitulis minoribus bracteis hirsutis."

Seymour (1929) reports that this species is infested by the fungi Cladosporium herbarium (P.) ex Ik. and Sphaerella lippiae Frago & Ciferri. The species is known only from the type collections. Material has been misidentified and distributed in herbaria as Lantana sp.

In all, 4 mounted photographs of type material have been examined by me.

Citations: BRAZIL: Piauí: G. Gardner 2940 [Macbride photos 24664] (It--photo of cotype, Kr--photo of cotype, N--photo of cotype, W--photo of cotype).

LIPPIA RHODOCNEMIS Mart. & Schau. ex Schau. in A. DC., Prodr. 11: 592. 1847.

Synonymy: Lippia rhodomensis Mart. & Schau. ex Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 151, sphalm. 1895. Lippia rhodocnemis Cham. ex Moldenke, Résumé Suppl. 3: 33, in syn. 1962. Lippia rhodocnenis Mart. & Schau. ex Moldenke, Résumé Suppl. 12: 11, in syn. 1965.

Bibliography: Schau. in A. DC., Prodr. 11: 592. 1847; Schau. in Mart., Fl. Bras. 9: 249 & 307, pl. 40. 1851; Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 95. 1894; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 151. 1895; Massart & al., Mission Belg. Brésil 1922-23 1: fig. 431. 1929; Stapf, Ind. Lond. 4: 125. 1930; Worsdell, Ind. Lond. Suppl. 2: 58. 1941; Moldenke, Known Geogr.

Distrib. Verbenac., [ed. 1], 37 & 96. 1942; Moldenke, Alph. List Cit. 2: 558 (1948) and 3: 691 & 710. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 81 & 190. 1949; Moldenke, Résumé 94 & 462. 1959; Rennó, Levant. Herb. Inst. Agron. Minas 150. 1960; Moldenke, Résumé Suppl. 3: 33 (1962), 8: 5 (1964), and 12: 11. 1965; Moldenke, Phytologia 12: 24. 1965.

Illustrations: Schau. in Mart., Fl. Bras. 9: pl. 40. 1851; Massart & al., Mission Belg. Brésil 1922-23 1: fig. 431. 1929.

Shrub, 1--1.5 m. tall, branched, tomentose throughout with hirtous and glanduliferous hairs intermixed; leaves decussate-opposite or approximate, fragrant, spreading, short-petiolate, variable in size and shape; petioles about 6 mm. long; leaf-blades ovate-elliptic or lanceolate, 1.5--6 cm. long, 1--4 cm. wide, subacute or obtuse at the apex, crenate along the margins, penninerved, rugose-venose above, subcanescent beneath, sometimes subovate with a rounded base, sometimes oblong or lanceolate with an acuminate base, marked with shiny sessile glands beneath the tomentum on the lower surface; peduncles axillary, solitary, 1.5--2.5 cm. long, shorter than the subtending leaves; heads about the size of a cherry (*Prunus cerasus* L.); bractlets subherbaceous-membranous during anthesis, more or less colored, ovate, 6--8 mm. long, subequaling the corollas, subacuminate at the apex, manyveined and reticulate, glandulose, hirsutulous, somewhat enlarged after anthesis to 1.2 cm. and then thin, pellucid, and conspicuously reticulate; calyx about 2 mm. long, hirtous, bifid, acutely 4-dentate; corolla hypocrateriform, violet or rose, about 8 mm. long, villosulous on the outside, its tube somewhat incurved, ventricose-ampliate above, sparsely villous within, the limb small, the lobes rounded, the lowest one enlarged, the rest smaller; stamens and pistil typical of the genus; fruit subclavate-obcordate; seeds equal.

This distinct species is based on a collection made by Carl Friedrich Philipp von Martius (no. 1474) at Chapada, and one made by Johann Emanuel Pohl in the Serra dos Pinheiros, Minas Gerais, Brazil, deposited in the herbarium of the Botanische Staatssammlung at Munich and the Naturhistorisches Museum at Vienna. Schauer (1847) places it in his Subsection B of Section *Rhodolippia*. It apparently grows on campos, flowering in May and June. Schauer describes the flowers as "rose", but Mendes Magalhaes 1815 had them "violet". The Holway & Holway 406 collection is infested with the fungus *Puccinia lantanae* Farl. The Holway & Holway 1006, distributed as *L. rhodocnemis*, is actually *Lantana hypoleuca* Briq., Pickel 2319 is *Lantana radula* Sw., and Pohl 809 is not verbenaceous.

In all, 4 herbarium specimens and 4 mounted photographs, including photographs of cotype material, have been examined by me.

Citations: BRAZIL: Minas Gerais: Martius 1474 [Macbride photos 20331] (It--photo of cotype, Kr--photo of cotype, N--photo of cotype, W--photo of cotype); Mendes Magalhaes 1815 [Herb. Jard. Bot. Belo Horiz. 41747] (Be--13949, N, N). Rio de Janeiro: Holway &

Holway 406 (N).

LIPPIA RIEDELIANA Schau. in A. DC., Prodr. 11: 582. 1847.

Bibliography: Schau. in A. DC., Prodr. 11: 582. 1847; Schau. in Mart., Fl. Bras. 9: 234. 1851; Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 95. 1894; Hayek, Denkschr. Kaiser. Akad. Wissen. Math.-nat. 79 (1): 296. 1908; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 37 & 96. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 78. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 81 & 190. 1949; Moldenke, Phytologia 3: 305. 1950; Moldenke, Résumé 94 & 462. 1959; Moldenke, Phytologia 12: 24. 1965.

Strigose-hirtellous and subviscid throughout; branches 15--22 cm. long, apparently issuing from a creeping rhizome, many, erect, woody at the base, subterete; leaves small, decussate-opposite, rather crowded, sessile, ovate, subacute at the apex, rounded at the base, crenate and revolute along the margins except at the entire base, patulous, rugose-venose, the venation pinnate, impressed above, prominulent and hirtellous beneath, with sessile glands in the areoles beneath; peduncles solitary in the upper axils, filiform, exserted, twice or more times as long as the subtending leaves; heads hemispheric, rather large, about 1.2 cm. wide, loosely imbricate, terminal on the peduncles; bractlets herbaceous, broadly ovate, 4 mm. wide at the base, very shortly acuminate at the apex, shorter than the corolla-tube, strigose-pubescent on both surfaces, long-ciliate on the subreflexed margins, 3--5-veined on the back and pulverulent-glandulose with scattered sessile glands among the pubescence; calyx obovate, compressed, 2 mm. long, villosulous and pulverulent-glandulose, very shortly bifid, the segments 2-toothed; corolla purple, rather large, exserted, subvillous outside and with shiny resinous glands, its tube 6 mm. long, slightly incurved, slightly ampliate above, the limb with the upper lip emarginate, the lower lip with its middle lobe subretuse and the lateral ones ovate and obtuse.

The type of this little-known species was collected by Ludwig Riedel -- in whose honor it is named -- in sandy and gravelly places near Tejuco, Minas Gerais, Brazil, flowering in December, and is deposited in the herbarium at Leningrad. Schauer (1847) places it in his Section Zapania, Subsection Axilliflorae, and (1851) says of it "Habitus quodammodo *L. pumilae* a qua vero capitulis floribusque majoribus bracteisque latis facile discriminatur." Hayek (1908) cites Wettstein & Schiffner s.n. from "Circa Parna-hyba ad fl. Tieté, ca. 700 m. s. m., V. 1901", São Paulo. I know nothing whatever of this species except what is given in the literature.

LIPPIA RIGIDA Schau. in A. DC., Prodr. 11: 577. 1847.

Bibliography: Schau. in A. DC., Prodr. 11: 577. 1847; Schau. in Mart., Fl. Bras. 9: 228. 1851; Hiern, Vidensk. Meddel. Kjöbenh. 1877-78: 97. 1877; Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 95. 1894; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 37 & 96 (1942) and [ed. 2], 81 & 190. 1949; Moldenke, Alph. List Cit. 3: 691 & 712. 1949; Moldenke, Résumé 94 & 462. 1959; Moldenke, Phyto-

logia 12: 23. 1965.

Much-branched rather rigid shrub, hirtellous throughout; branches and branchlets dense, rather rigid, subterete, leafy, pubescent-hirtellous, subincanous; leaves small, decussate-opposite or ternate, oval or subrotund, 4--8 mm. long and equally as wide, very short-petiolate, obtuse or subacute at the apex, crenate along the margins, very rugose, penninerved, strigose with depressed rigid hairs, incanous-hirsute beneath, often with abbreviated densely leafy twigs in their axils, inflexed, the upper ones gradually smaller; peduncles many, aggregate at the apex of the branchlets, canescent, 8 mm. long, varying from single to paired or quaternate in the axils of the upper leaves, flaccid; heads tetraquetrous-globose or ovoid, exserted, 4--6 mm. long during anthesis, canescent; bractlets pale, broadly ovate, short-acuminate at the apex, imbricate, farinose-glandulose, the keel and margins hirsute, equaling the corolla-tube; calyx 1.5 mm. long, pale, hirsute, loosely investing the base of the corolla-tube, very shortly 4-toothed, finally bifid; corolla small, its tube slightly incurved, somewhat more than 3 mm. long, ventricose above the middle, puberulent and resinous-glandulose, the limb white or yellowish, undulate, inflexed, puberulent and resinous-glandulose on the back, the lobes rounded, the sinuses smooth and revolute, the lowest lobe transversely oblong, broadly unguiculate.

The type of this little-known species was collected by Carl Friedrich Philipp von Martius in woods near Maracas, Catingas, Bahia, Brazil, flowering in November, and is deposited in the Martius Herbarium at Munich, where it was photographed by Macbride as his type photograph number 20332. Schauer (1847) places the species in his Section Goniostachyum, and says (1851) of it "Affinis *L. microphyllae* et *glandulosae*; ad utraque aspectu rigido, ramulis ad apices tantum floriferis, foliorum bractearumque figura et indumento distincta." Material has been misidentified and distributed in herbaria under the name *L. microphylla* Cham. & Schlecht. Only 4 mounted photographs of the type have been examined by me.

Citations: BRAZIL: Bahia: Martius s.n. [Macbride photos 20332] (It--photo of type, Kr--photo of type, N--photo of type, W--photo of type).

LIPPIA RODRIGUEZII Moldenke, *Lilloa* 5: 426. 1940.

Synonymy: *Lippia rodriguezii* Moldenke, *Résumé* 316, in syn. 1959.

Bibliography: Moldenke, *Lilloa* 5: 426. 1940; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 1], 43 & 96. 1942; Moldenke, *Lilloa* 10: 379 (1944) and 14: 45. 1948; H. N. & A. L. Moldenke, *Fl. Life* 2: 79. 1948; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 105 & 190. 1949; Moldenke, *Alph. List Cit.* 2: 441 & 444 (1948), 3: 863 (1949), and 4: 1257. 1949; E. J. Salisb., *Ind. Kew. Suppl.* 11: 138. 1953; Moldenke, *Résumé* 126, 316, & 462. 1959; Troncoso, *Bol. Soc. Argent. Bot.* 9: 184. 1961.

Dioecious shrub, to 1.4 m. tall; branches slender, erect, obtusely tetragonal, densely appressed-strigose with short, rather

harsh, white hairs; nodes conspicuously annulate; twigs short, very slender, densely spreading-pubescent, the pubescence brown and more or less glandular; leaves decussate-opposite, short-petiolate or subsessile; petioles obsolete or to 5 mm. long (on large leaves) and flattened-ampliate or margined, appressed-strigillose; leaf-blades subcoriaceous, uniformly gray-green on both surfaces when mature, thinner and brunnescent in drying when immature, oblong or narrowly elliptic, 3--5.5 cm. long, 5--10 mm. wide, acute at the apex, regularly serrulate from the middle to the apex with small, acute, appressed, antrorse teeth, acute and attenuate into the petiole at the base, scabrous and densely appressed-strigillose above with harsh antrorse white hairs, more densely strigose-pubescent beneath, the pubescence albidous; midrib, secondaries, and veinlet reticulation deeply impressed above, prominent or prominulous beneath; inflorescence axillary, about equaling the immature subtending leaves or surpassing them, 1.5--3 cm. long; peduncles filiform, 1--2.5 cm. long, densely glandular-pubescent with brown spreading hairs; heads compact, not elongating; bractlets linear, densely strigose-pubescent, brownish; corolla hypocrateriform, yellow or orange.

The type of this species was collected by Demetrio Rodriguez (no. 609) -- in whose honor it was named -- at Santa Ana, Misiones, Argentina, on September 21, 1912, and is deposited in the Britton Herbarium at the New York Botanical Garden. The species has been found growing in grassy places, flowering in April, September, November, and December. The flowers are said to have been "yellow" on Schulz 1330, 2443, and 2521, but "orange" on his 1465, 1533, and 1882.

In all, 20 herbarium specimens, including the types of both names involved, have been examined by me.

Citations: ARGENTINA: Misiones: Bertoni 2042 (N); Ekman 2005 (Mi, N, S), 2006 (Mi, N, S); D. Rodriguez 609 [Herb. Mus. Argent. Cienc. Nat. 23850] (Ca--3491--isotype, It--isotype, N--type, N--isotype, Ra--isotype, W--1858287--isotype); G. J. Schwarz 1330 (N), 1465 (N), 1533 (N), 1882 (N), 2443 (N, Vi), 2521 (N).

LIPPIA ROSMARINIFOLIA Anderss., Galap. Veg. 198. 1854.

Bibliography: Anderss., Galap. Veg. 198. 1854; Anderss., Vet. Akad. Handl. Stockh. 1853: 198. 1855; Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 95. 1894; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 34 & 96. 1942; Moldenke, Phytologia 2: 335 (1947) and 2: 415. 1948; Moldenke, Castanea 13: 116. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 70 & 190. 1949; Moldenke, Alph. List Cit. 3: 950 & 972 (1949) and 4: 1165 & 1223. 1949; Moldenke, Résumé 81 & 462. 1959.

Shrub, 2 m. or more tall; branches strict, virgate, thick, divided, terete, thickened at the nodes; bark dark-grayish; ultimate branchlets obsoletely tetragonal, brunnescent, strigose with very short deflexed-appressed white hairs; leaves decussate-opposite, sessile, brunnescent in drying, narrowly linear, 1.2--2.7 cm. long, 4--6 mm. wide, rather acute at the apex, entire and revolute along

the margins, narrowed toward the base, the venation lineate-impressed above, very much roughened with very short hairs or prickles which are tuberculate-based, very shortly setulose-hispid beneath, the midrib thick, prominent, the lamina cinereous-tomentose; peduncles axillary, tetragonal, about twice as long as the subtending leaves, spreading-erect, somewhat sulcate above, grayish-strigose; heads subglobose or obovate, 20--30-flowered; bractlets many-ranked, imbricate, gray-hispid on the outer surface, the lower ones ovate-cordate, acute at the apex, the upper ones spatulate, $1/3$ to $1/2$ as long as the flowers, very minutely apiculate at the apex; calyx tubular-campanulate, bilabiate, bicarinate-subcompressed, hispid-pilose especially above, loosely enveloping the mature fruit, the 2 entire segments surpassing the fruit; corolla hypocrateriform, lilac, the tube elongate, glabrous below, campanulate-dilated and gray-hispid above, the lobes of the limb short, suberect, hispid on the outer surface; fruit 1 mm. long, osseous, globose-apiculate, greenish-gray, glabrous, minutely punctulate; cocci 2, splitting apart when mature.

The type of this very distinctive species was collected by Nils Johan Andersson in very dry places in the interior portions of Albemarle, Galapagos Islands, and is deposited in the herbarium of the Naturhistoriska Riksmuseum at Stockholm. He says of it (1854): "Videtur *L. stoechadiflorae* (ex insulis Caribaeis et America meridionali littorali) quodammodo affinis, cujus tamen folia mucronato-serrata!"

Stewart says of *L. rosmarinifolia* "occasional bushes on lava beds near sea level [and] at 650 feet, common at 1300--1500 feet", and found it in flower in April, August, September, and November. His no. 3309 has extra large leaves -- to 2.7 cm. long and 6 mm. wide. The Snodgrass & Heller 890, distributed as *L. rosmarinifolia*, is actually var. *stewarti* Moldenke.

In all, 16 herbarium specimens, including the type, and 4 mounted photographs have been examined by me.

Citations: GALAPAGOS ISLANDS: Abingdon: Snodgrass & Heller 827 (Du--9516); A. Stewart 3304 (Gg--31214). Albemarle: N. J. Andersson s.n. (F--photo of type, N--photo of type, S--type, Si--photo of type, Z--photo of type); Snodgrass & Heller 233 (Du--9514); A. Stewart 3305 (Gg--31218), 3306 (Gg--31207), 3308 (Bi, Gg--31210, N, W--921593), 3311 (Bi, Gg--31212, N, W--921594). James: A. Stewart 3309 (Gg--31211). Narborough: A. Stewart s.n. (Gg--31213).

LIPPIA ROSMARINIFOLIA var. *STEWARTI* Moldenke, *Phytologia* 2: 415--416. 1948.

Bibliography: Moldenke, *Phytologia* 2: 415--416. 1948; Moldenke, *Castanea* 13: 116. 1948; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 70 & 190. 1949; Howell, *Wasmann Journ. Biol.* 10: 377. 1952; Moldenke, *Résumé* 81 & 462. 1959.

This variety differs from the typical form of the species in having pinnately lobed leaf-blades, the lobes on smaller leaves being tooth-like, divergent, 1--3 per side.

The type of this variety was collected by Alban Stewart (no. 3307) -- in whose honor it was named -- on the sides of a mountain, to 4000 feet altitude, at Tagus Cove, Albemarle, Galapagos Islands, on March 27, 1906, and is deposited in the herbarium of the California Academy of Sciences at San Francisco. It was originally identified and distributed in herbaria as L. rosmarinifolia Anderss. and the taxon is known thus far only from the original collection.

In all, 3 herbarium specimens, including the type, and 4 mounted photographs have been examined by me.

Citations: GALAPAGOS ISLANDS: Albemarle: A. Stewart 3307 (F--photo of type, Gg--31209--type, N--isotype, N--photo of type, Si--photo of type, W--543207--isotype, Z--photo of type).

LIPPIA ROTUNDIFOLIA Cham., Linnaea 7: 230. 1832.

Synonymy: Lippia vauthieri Briq., Ann. Conserv. & Jard. Bot. Genève. 4: 234. 1900. Lippia rotundifolia Cham. & Schlecht. ex Moldenke, Alph. List Invalid Names Suppl. 1: 15, in syn. 1947.

Bibliography: Cham., Linnaea 7: 230. 1832; Steud., Nom. Bot., ed. 2, 2: 54. 1840; D. Dietr., Syn. Pl. 3: 599. 1843; Walp., Repert. Bot. Syst. 4: 52. 1845; Schau. in A. DC., Prodr. 11: 590. 1847; Schau. in Mart., Fl. Bras. 9: 245--246 & 302, pl. 39. 1851; Hiern, Vidensk. Meddel. Kjöbenh. 1877-1878: 99. 1877; Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 95. 1894; Schimper, Pflanzen-Geogr. 402. 1898; Briq., Ann. Conserv. & Jard. Bot. Genève. 4: 234. 1900; K. Schum. in Just, Bot. Jahresber. 28 (1): 496. 1902; Thiselt.-Dyer, Ind. Kew. Suppl. 2: 106. 1904; Glaz., Bull. Soc. Bot. France 58, Mém. 3: 542. 1911; Stapf, Ind. Lond. 4: 125. 1930; Herter, Florul. Urug. 105. 1930; Herter, Revist. Sudam. Bot. 4: 186. 1937; Herter, Beih. Bot. Centralbl. 59: 275. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 37 & 96. 1942; Moldenke, Alph. List Invalid Names 32. 1942; Moldenke, Alph. List Cit. 1: 97, 106, 170, 231, & 238. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 15. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 87. 1948; Moldenke, Lilloa 14: 13. 1948; Moldenke, Alph. List Cit. 2: 367, 369, 484, & 486 (1948), 3: 693, 710, 725, 731, 921, & 922 (1949), and 4: 1072, 1086, 1106, 1203, 1204, & 1300. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 81 & 190. 1949; Moldenke, Phytologia 4: 70. 1952; Moldenke, Résumé 94, 307, 316, 318, & 462. 1959; Rennó, Levant. Herb. Inst. Agron. Minas 150. 1960; Moldenke, Phytologia 12: 24 & 239. 1965.

Illustrations: Schau. in Mart., Fl. Bras. 9: pl. 39. 1851; Schimper, Pflanzen-Geogr. 402. 1898.

Perennial suffrutescent herb or subshrub, to 2 m. tall, showy when in flower; stems branched above; floriferous branchlets fastigiate or subfastigiate, corymbose-paniculate, velutinous-tomentose, becoming fuscous, leafless at the base, confluent with the floriferous ones, the lowest internode elongate; sterile nodes few, approximate; leaves decussate-opposite or subverticillate in 3's or 4's, subequaling the internodes; petioles short; leaf-blades stiffly thick-coriaceous, patulous, subrotund, rather con-

cave, obtuse or very shortly acuminate at the apex, serrate-crenate along the margins, attenuate into the petiole at the base, shiny and very scabrous above, sometimes with short rigid hairs, reticulate-veined and scrobiculate beneath, canescent with velutinous tomentum beneath, sometimes rubiginous, the lowest ones largest, about 5 cm. long and 4 cm. wide, decreasing in size upwards, those beneath the inflorescence smallest; inflorescence subspicate, short-pedunculate, solitary or 2 per leaf-axil, surpassing the subtending leaves, congested at the tips of the branchlets in the form of a compact thyrse; heads many-flowered, at first subcapitate and 1.5 cm. long, elongating during anthesis and finally to 3 cm. long and very lax, nodding; bractlets loosely imbricate, subconcave, membranous, colored, lanceolate, about 8 mm. long, equaling the corolla-tube, long-acuminate at the apex, 5-veined, velutinous, slightly incurved; calyx very short, very hispid, bifid, the lobes very shortly bidentate, finally separating into two halves; corolla hypocrateriform, violet or pink to rose or red, hirtellous on the outside, the tube about 8 mm. long, slightly incurved, ventricose above, the throat yellow and villosulous, the limb rather large, glistening-velutinous, the upper and lateral lobes rounded, the latter half as large, the lowest lobe obovate-truncate, expanded; fruit typical of the genus, obcordate, minute, dark-fuscous, shiny, apiculate at the apex because of a rudimentary style, separating into two parts.

The type of this species was collected by Friedrich Sellow (no. 1440) "ad Parauna el [=et] praedia Junonis et Caroli", Minas Gerais, Brazil, and was deposited in the herbarium of the Botanisches Museum at Berlin, but is now destroyed. The type of *L. vauthieri* was collected by Vauthier (no. 202) -- in whose honor it is named -- somewhere in Minas Gerais, and is deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques at Geneva, where it was photographed by Macbride as his type photograph number 24675.

Schauer (1847) classifies the species in his Section *Zapania*, Subsection *Corymbosae*. In his 1851 work he cites also two unnumbered Pohl collections from "ad S. João d'El Rey in rupibus et ad S. João Baptista" and a Riedel s.n. from "in montibus S. João, Junio", Vauthier s.n. from "prope Tejuco", and Lund s.n. from "in campis circa Sabara, Novembri [Kunth, Herb. Br. no. 200]". He also says of this plant "toto habitu insignis, corymbis floridis ornatissimus....Odor spicularum tritartum fortis subcamphoratus, fere Salviae officinalis."

The species has been found growing on campos and flats, and growing among rocks on high campos, at altitudes of 1000 to 1190 meters, flowering from April to September and in November and December, fruiting in September. Mexia describes it as "infrequent". L. B. Smith 7066 shows leaves that are somewhat more acute than usual at the apex. The flowers are described as "pink" on Mexia 5870a, "violet" on Mendes Magalhães 4324, "rose" on Mendes Magalhães 3023 and Macedo 3313, and "red" on Brade 13456.

Material has been misidentified and distributed in herbaria as Hyptis sp. On the other hand, the Glaziou 21896, distributed as L. rotundifolia, is actually L. lacunosa Mart. & Schau.

In all, 41 herbarium specimens, including type material of all the names involved, and 5 mounted photographs have been examined by me.

Citations: BRAZIL: Góias: Macedo 3313 (N, S). Minas Gerais: Brade 13456 [Herb. Rio de Jan. 29537] (B); J. F. de Castro 66 (Sp—31302); P. Clausen 126 [Herb. Martius 1036] (Br, Br, M, S), 260 (Br), 322 (N), 1275 (N), 1398 (W—1706069), s.n. [Aug.—April 1840] (Br, Br); Glaziou 15333 (B, Br), 17160 (Br, Br, C), 17161 (C), 19745 (B); Herb. Rio de Jan. 14857 (Ja); Hoehne & Gehrt s.n. [Turvo] (Sp—17476); A. Lutz 1095 (Z); Macedo 3773 (S, W—2197207); Mello Barreto 3199 [Herb. Jard. Bot. Belo Horiz. 4582] (N), 3202 (Ja—32303); Mendes Magalhães 3023 (Be—14851, W—2124264), 4324 [Herb. Jard. Bot. Belo Horiz. 45131] (N); Mexia 5870a (N, S); Sellow 1440 (N—-isotype, N—photo of isotype, Vt—-isotype, Z—photo of isotype), s.n. [Brasília] (Br); L. B. Smith 7066 (W—2124676); Vauthier 202 [Macbride photos 24675] (Kr—photo, N—photo, W—photo); Warming 212 (S), s.n. [Lagoa Santa] (N). State undetermined: Dupré s.n. [Brésil méridional] (N); Labrato 49 (N).

LIPPIA RUBIGINOSA Schau. in A. DC., Prodr. 11: 574—575. 1847.

Synonymy: Lippia rubiginosa α dives Schau. in A. DC., Prodr. 11: 575. 1847. Lippia rubiginosa β pauper Schau. in A. DC., Prodr. 11: 575. 1847. Lippia rubiginosa var. pauper Schau. ex Moldenke, Alph. List Invalid Names Suppl. 1: 15, in syn. 1947. Lippia rubiginosa φ pauperior Schau. ex Moldenke, Alph. List Invalid Names Suppl. 1: 15, in syn. 1947.

Bibliography: Schau. in A. DC., Prodr. 11: 574—575. 1847; Schau. in Mart., Fl. Bras. 9: 223. 1851; Hiern, Vidensk. Meddel. Kjöbenh. 1877-1878: 97. 1877; Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 95. 1894; Briq., Ann. Conserv. & Jard. Bot. Genève. 7-8: 306. 1904; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 37 & 96. 1942; Moldenke, Alph. List Invalid Names Suppl. 1: 15. 1947; Moldenke, Alph. List Cit. 2: 485 (1948), 3: 689 & 920 (1949), and 4: 1015, 1106, & 1156. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 81 & 190. 1949; Moldenke, Résumé 94, 316, & 462. 1959; Troncoso, Darwiniana 12: 260. 1961; Moldenke, Phytologia 7: 334. 1961; Moldenke, Résumé Suppl. 8: 5 (1964) and 12: 4. 1965; Moldenke, Phytologia 12: 23, 47, 96, 152, 170, 310, & 333. 1965.

Shrub; branchlets strict, spreading, tetragonal, cinnamon-colored, abundantly floriferous, scabrous-tomentose; leaves decussate-opposite; petioles about 6 mm. long, densely appressed-pubescent or hirtellous; leaf-blades oblong, acute or obtuse at the apex, crenate-serrulate along the margins, attenuate into the petiole at the base, penninerved, green and lineate- or plicate-rugose above, strigose-puberulent above, greenish- or subferrugineous-

canescent and tomentose beneath with very short hairs, glandulose beneath the indumentum, finally rufescent, the larger ones about 2.5 cm. long and 8 mm. wide, the venation densely appressed-pubescent or hirtellous beneath; peduncles numerous, usually 2 or 4 per axil, filiform, about 1.2 cm. long, flaccid, shorter than the subtending leaves, deflexed or nutant, densely appressed-pubescent or hirtellous; heads at first ovoid, becoming more elongate and cylindric in succession later, 4-quetrous; bractlets membranous, broadly ovate, loosely imbricate, acute at the apex, shorter than the corolla-tube, lightly glandular-pulverulent and puberulent, ciliate on the keel and margins; corolla hypocrateriform, small, white, greenish in drying, the limb undulate-crisped.

This species was proposed by Schauer in 1847 on the basis of two subspecific entities, the first of which may be regarded as being typical of the species proper: (1) dives, with "foliis majoribus simulaque planis, obtusis, subtus inter nervos laterales prominentes venosis pubaque exili tomentosis magisque ferrugineis; pedunculis plerumque quaternis octonis", based on Sellow 1203 from somewhere in Minas Gerais and a Lund collection made in December "in saxosis ferruginosis" near Ouro Preto, Minas Gerais. (2) pau-per, with "foliis minoribus, plicato-rugosis, acutis, nervis subtus approximatis una cum areolis pube hirtella canescentibus; pedunculis plerumque geminis" and based on a Schuch and an Ackermann collection from somewhere in Minas Gerais. Schauer states that his original specimens were deposited in the herbaria at Berlin and Vienna and in the DeCandolle Herbarium at Geneva. The Sellow specimen was deposited in the herbarium of the Botanisches Museum at Berlin, where it was photographed by Macbride as his type photograph number 17537, but is now destroyed.

Briquet (1904) compares this species with L. balansae as follows: "Cette espèce [L. balansae] se place tout près du L. rubiginosa.....dont elle se distingue facilement par ses feuilles (ternées) plus grandes, largement ovées, très scabres (et non strigoso-pubescentes) en dessus, à nervation très réticulée-rugueuse mais assez différente par la disposition des nervures latérales, par ses pédoncules égalant ou dépassant un peu les feuilles (et non pas notablement plus courts), ses bractées doucement pubescentes extérieurement (et non pas à peine puberulentes-glanduleuses et ciliées sur les marges)."

In his 1847 work Schauer places the species in his Section Goniostachyum, but in the 1851 he calls the section Goniolippia. The species has been found in fields, flowering in December and January. Material has been misidentified and distributed in herbaria as L. organoides H.B.K. On the other hand, the Warming s.n. [Lagoa Santa], distributed as L. rubiginosa, is actually L. elegans Cham. The F. C. Hoehne s.n. [Sta. Barbara, 10-1-1921], cited below, was incorrectly cited by me in *Phytologia* 12: 152 (1965) under L. elegans.

In all, 6 herbarium specimens and 15 mounted photographs, including phototype material of all the names involved, have been

examined by me.

Citations: BRAZIL: Minas Gerais: Ackermann s.n. [1834] (F--photo, N--photo, Si--photo, Z--photo); F. C. Hoehne s.n. [Sta. Barbara, 10-1-1921] (N, N, Sp--4859); Macedo 2071 (N, S); Sampaio 456 (Ja--14856, Ja); Sellow 1203 [Macbride photos 17537] (It--photo of cotype, Kr--photo of cotype, N--photo of cotype, N--photo of cotype, W--photo of cotype); Ule 2671 (Ja--14894, Ja--31635, Z); s.n. [Herb. Rio de Jan. 31635] (N). São Paulo: Glaziou 16286a (Ja--11108).

LIPPIA RUGOSA A. Chev., Bull. Soc. Bot. France 58, Mém. 8: 191. 1912.

Bibliography: A. Chev., Bull. Soc. Bot. France 58, Mém. 8: 191. 1912; A. Chev., Expl. Bot. Afr. Occid. Franç. 1: 503. 1920; Prain, Ind. Kew. Suppl. 5: 153. 1921; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 46 & 96. 1942; Moldenke, Phytologia 2: 340 (1947) and 2: 482. 1948; Moldenke, Alph. List Cit. 2: 402, 631, 635, & 640 (1948), 3: 675, 750, 759, 768, 817, 877, 894, & 924 (1949), and 4: 996, 1083, 1084, 1093, 1095, 1137, 1164, 1173, 1174, 1177, 1201, 1202, 1209, 1219--1221, 1248, 1260, 1289, 1292, 1298, & 1299. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 10. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 111--115 & 191. 1949; Moldenke, Phytologia 3: 136 & 137 (1949) and 3: 291 & 292. 1950; Moldenke, Résumé 136, 138, & 462. 1959; Moldenke, Phytologia 12: 41 & 298. 1965.

A large herb or subshrub, 2--2.5 m. tall; stems 5 or 6 from the same root-crown, bushy, branched at the apex, lightly pubescent on the lower parts; leaves decussate-opposite; petioles about 5 mm. long, scabrous; leaf-blades oblong or lanceolate-oblong, 10--15 cm. long, 3.5--4.5 cm. wide, acute at the apex, crenulate along the margins, very rugose and strongly reticulate-veined; flowers borne in congested heads which form a loose elongate panicle; heads sessile or on peduncles 5--25 cm. long, globose-elongate, 10--12 mm. long, 7--9 mm. wide, rather loose; bractlets oblong, about 4 mm. long, long-acuminate at the apex, pubescent, the acumination itself recurved-hooked at the tip; calyx about 1.5 mm. long, 2-lobed, villous; corolla hypocrateriform, white or cream-colored, yellowish in the throat, shorter than the bractlets.

The type of this species was collected by Auguste Jean Baptiste Chevalier (no. 20410) "dans la grande brousse marécageuse" near Faranah, Tagania, in the Republic of Guinea, on January 12, 1909, and is probably deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris. The original publication is sometimes given as "A. Chev., Novit. Fl. Afr. 4: 191. 1912". Hutchinson reduces the species to synonymy under what is now known as L. abyssinica (Otto & Dietr.) Cuf.

Lely says "A large herb growing in rock and grass; flowers cream; 6--7 feet tall; very like no. 320 but heads smaller and plant much taller." As yet I have not seen any material of his no. 320. Most of the material cited by me as L. rugosa in my 1948 and

1949 publications proves to be L. multiflora Moldenke or one of the several other taxa in this complex. In all, only 3 herbarium specimens of L. rugosa, including the type collection, and 5 mounted photographs have been examined by me.

Citations: REPUBLIC OF GUINEA: A. Chevalier 20410 (K--isotype). NORTHERN NIGERIA: Lely 582 (F--photo, K, N, N--photo, Sg--photo, Si--photo, Z--photo).

LIPPIA SALAMENSIS Loes., Verh. Bot. Ver. Brand. 53 : 77--78 [Abhandl. 242--243]. 1912.

Bibliography: Loes., Verh. Bot. Ver. Brand. 53: 77--78 [Abhandl. 242--243]. 1912; Prain, Ind. Kew. Suppl. 5: 153. 1921; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 20 & 96 (1942) and [ed. 2], 35 & 191. 1949; Moldenke, Alph. List Cit. 3: 689, 919, & 962 (1949) and 4: 1246. 1949; Moldenke, Résumé 42 & 462. 1959.

Shrub, about 2 m. tall; branchlets obsoletely and obtusely tetragonal, finally subterete, densely pubescent-subsericeous with appressed hairs, the young ones to 3 mm. in diameter; principal internodes 2.5--7 cm. long; leaves decussate-opposite, moderately or long-petiolate; petioles 0.6--3 cm. long; leaf-blades ovate or ovate-elliptic to obovate-elliptic, 7--17 cm. long, 2.8--8.5 cm. wide, membranous or subchartaceous, rounded or obtuse in outline and often very shortly and obsoletely acuminate at the apex, crenulate-serrulate along the margins, cuneate at the base and gradually attenuate into the petiole, pubescent-sericeous or densely pubescent-subsericeous above with appressed hairs, pubescent and glandulose beneath, gray-olivaceous above in drying and paler beneath, smaller to minute in the inflorescences at the apex of the branchlets; midrib and secondaries conspicuous above, prominent or prominent beneath; veinlet reticulation prominulous near the margins beneath; inflorescence axillary; peduncles mostly about 5 per axil, 9--20 mm. long, more or less pubescent-subsericeous with appressed hairs; heads almost semiglobose during anthesis, about 5 mm. long and 7 mm. wide at the base, ellipsoid and to 10 mm. long and 8--9 mm. wide when in fruit; bractlets subhyaline, reticulate-veined, villosulous-pubescent on both surfaces, ciliolate along the margins, cordiform-deltoid during anthesis and then about 3 mm. long and 5 mm. wide, cordiform-reniform in the fruiting condition and then about 4 mm. long and 8 mm. wide; flowers sweet-smelling when fresh; calyx compressed, about 2.4 mm. long, very hirsute, 2-lobed, the lobes themselves shortly deltoid-bilobulate; corolla whitish when fresh, scarcely surpassing the calyx, the tube ampliate above, puberulent under a handlens on the outer surface, the limb 4-lobed, the anterior lobe scarcely larger than the remainder and apparently eciliate, the others very shortly ciliolate under a handlens; fruit 2-seeded, the seeds easily separable.

This species is based on two collections made by Caecilia and Georg Eduard Seler (nos. 2483 & 3404) in woods by Cuesta Choacruz, dept. Salama, and above Morazán, Baja Verapaz, Guatemala, originally deposited in the herbarium of the Botanisches Museum at Berlin, where the latter was photographed by Macbride as his type

photograph number 17538; both now destroyed. The specific epithet is sometimes written with an uppercase initial letter. Seler & Seler 3404 is sometimes referred to as "Seler 3404". Standley refers to the plant as "common" in damp oak forests at about 1650 meters altitude. It has been collected in anthesis and fruit in November and December.

Loesener (1912) says of this plant: "Die durch die an der Spitze abgerundeten und an der Basis lang keilförmig in den verhältnismässig langen Stiel verschmälerten Blätter höchst charakteristische Art dürfte in die Grupp Euzapania gehören und hier eine ziemlich isolierte Stellung einnehmen." He describes the peduncles as 9--20 "cm." long, but this most certainly is an error for "mm."

In all, 5 herbarium specimens, including cotype material, and 6 mounted photographs have been examined by me.

Citations: GUATEMALA: Baja Verapaz: Seler & Seler 3404 [Macbride photos 17538] (Du--283960--cotype, G--cotype, G--photo of cotype, Gg--245893--cotype, Kr--photo of cotype, N--cotype, N--photo of cotype, N--photo of cotype, N--photo of cotype, Z--photo of cotype). Jalapa: P. C. Standley 77462 (N).

LIPPIA SALICIFOLIA Anderss., Galap. Veg. 198--199. 1854.

Bibliography: Anderss., Galap. Veg. 198--199. 1854; Anderss., Vet. Akad. Handl. Stockh. 1853: 198--199. 1855; Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 95. 1894; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 34 & 96. 1942; Moldenke, Phytologia 2: 335. 1947; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 70 & 191. 1949; Moldenke, Alph. List Cit. 4: 1164. 1949; Moldenke, Résumé 81 & 462. 1959.

Shrub, 2 m. or more in height; branches curving outwards, terete or tetragonal, virgate, thickened at the nodes; branchlets hirsute, appressed strigose-pilose toward the apex; leaves decussate-opposite; petioles very short, canaliculate above; leaf-blades oblong-lanceolate, 6.5--7.5 cm. long, almost 2.5 cm. wide, dark-green, nigrescent in drying, rather obtuse or subrotund at the apex, sharply but not deeply serrate or crenate-serrate and slightly curvate along the margins, cuneate-narrowed and entire at the base, obsoletely scattered-pilose with greatly appressed very short hairs above, very densely incanous-tomentose beneath, the midrib and secondaries regularly impressed above, elevated and hispid beneath; peduncles axillary, spreading or erecto-patent, scarcely 5 cm. long, incrassate, tetragonal, appressed-strigose; heads globose, becoming ovate-elongate after anthesis; bractlets imbricate in many ranks, ovate or broadly cuneate, apiculate at the apex, narrowed at the base, hirtous, half as long as the corolla-tube, subequal, widened at the middle, hispid-hirsute on the outer surface; calyx subglobose, obsoletely bicarinate-compressed when mature, cinereous-hirtous below, glabrescent at the base and on the inner surface, completely and closely enveloping the mature fruit but not surpassing it; corolla-tube twice as long as the calyx, amplicate above, smoothish, the limb deeply parted, the lobes revolute along the margins; fruit globose, about 2 mm. long, apiculate, gla-

brous, the cocci easily separable.

The type of this distinctive species was collected by Nils Johan Andersson (no. 209) in wooded spots on the side of a mountain-top, on Charles Island, Galapagos Islands, in 1852, and is deposited in the herbarium of the Naturhistoriska Riksmuseum at Stockholm. Andersson (1854) says: "Secundum descriptionem cum *L. asperifolia* valde congruit. Differt autem: pube nullo modo glandulosa, ramulis exacte tetragonis, bracteisque tubo corollae brevioribus." The species is known thus far only from the original collection, of which 4 herbarium specimens, including the type, and 8 mounted photographs have been examined by me.

Citations: GALAPAGOS ISLANDS: Charles: N. J. Andersson 209 (Br--isotype, F--photo of type, F--photo of isotype, N--isotype, N--photo of type, N--photo of isotype, S--type, S--isotype, Si--photo of type, Si--photo of isotype, Z--photo of type, Z--photo of isotype).

LIPPIA SALSA Griseb., Abhand. Kaiser. Gesell. Wiss. Götting. 19: 243--244. 1874.

Bibliography: Griseb., Abhand. Kaiser. Gesell. Wiss. Götting. 19: 243--244. 1874; Griseb., Pl. Lorentz. 195--196. 1874; Lorentz, Veg. Nordeste Prov. Entre Rios, ed. 1, 150. 1878; Griseb., Abhand. Kaiser. Gesell. Wiss. Götting. 24: [Symb. Fl. Argent.] 279. 1879; Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 95. 1894; Kuntze, Rev. Gen. Pl. 3 (2): 253. 1898; Seckt, Fl. Cordob. 418. 1929--1930; Seckt, Rev. Univ. Nac. Cordoba 17: 90. 1930; Moldenke, Lilloa 5: 427 (1940) and 8: 425. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 43 & 96. 1942; Moldenke, Lilloa 10: 379. 1944; Moldenke, Holmbergia 4: 150. 1945; Moldenke, Alph. List Cit. 1: 16, 96, 162, & 266. 1946; Lorentz, Veg. Nordeste Prov. Entre Rios, ed. 2, 150. 1947; Moldenke, Lilloa 14: 45. 1948; Moldenke, Alph. List Cit. 2: 376, 426, 442, & 537 (1948) and 3: 661, 689, & 746. 1949; Moldenke, Known Geogr. Distrib. Verbenac.. [ed. 2], 105 & 191. 1949; Moldenke, Phytologia 3: 76. 1949; Moldenke, Alph List, Cit. 4: 1062, 1080, 1088. 1090--1092, 1100, & 1172. 1949; Ragonese, Revist. Invest. Agric. 5: 35, 37, 45--52, 54, 57, 59, 61--64, 83, 85, & 206--208, fig. 44. 1951; Moldenke, Résumé 126 & 462. 1959; Moldenke, Phytologia 12: 23. 1965; Moldenke, Résumé Suppl. 12: 5. 1965.

Illustrations: Ragonese, Revist. Invest. Agric. 5: 209, fig. 44. 1951.

Shrub, resembling a small *Eryngium*; stems creeping, divaricate, tetragonal, scabrous; leaves decussate-opposite, small, sessile, ovate-lanceolate, spinescent at the apex, incised or few-lobed to entire along the thickened revolute margins, lepidote-granulose and setulose-hispidulous, the lobes 1 or 2 pairs, spreading, subulate-spinescent, "setulis e granula solitariis"; peduncles patent, greatly surpassing the subtending leaves; bractlets ovate-lanceolate, spinescent-acuminate, the exterior ones longer and subequaling the heads; heads turbinate-ovoid; sepals 2, somewhat coherent at the base, obtuse at the apex, one spatulate-oblong,

the other broader and emarginate; corolla hypocrateriform, varying from purple, bright-violet, lilac, bluish, or blue to pink, cream-color, whitish, or white, twice as long as the calyx, dilated from a tubular base, the upper lip emarginate, with very short subtruncate lobes, the middle lobe broader than the lower lip; stamens didynamous, the lower ones inserted at the middle of the corolla-tube; anthers subsessile; style much longer than the 2-celled ovary; stigma somewhat dilated.

The type of this species was apparently collected in thickets on the salt desert of Santiago del Estero, Argentina, although Macbride photographed Hieronymus & Lorentz 494, from somewhere in Catamarca, as the type (his type photograph number 17539), deposited in the herbarium of the Botanisches Museum in Berlin, but now destroyed.

The page reference for the original publication of the binomial is given as "234", "242", or "244" by some authors. Grisebach apparently regarded the species as belonging to a subgeneric group Diphyllocalyx, but that name more properly refers to the genus Nashia Millsp.

Lippia salsa has been found growing in dry red soil, saline soil, and very salty red soil, on mountainsides, hillslopes, in barnyards, and at salt mines, at altitudes of 270 to 700 meters, flowering from October to May, fruiting in May and November. A vernacular name recorded for it is "yerba del ciervo".

The flowers are described as "blue" or "bluish" on Venturi 7696, "bright violet" on Venturi 484, "cream-color" on Villafañe 7, "lilac" on Venturi 10300, "pink to white" on Ruiz Leal 9099, "pink, lilac to whitish" on Ruiz Leal 8839, "purple" on Bartlett 19759, "whitish" on Ragonese 6271, and "white" on Ragonese & Piccinini 6049, Venturi 5641, and Wall & Sparre s.n. [Metero, 9/11/46].

Ragonese (1951) says: "Caméfita o fanerófita de hasta 90 cm de altura, de hojas opuestas, rígidas, sésiles, profundamente incisodentadas, con dientes agudos, más o menos punzantes, con el margen revoluto y cubierta por pelos cortos, ralos y rígidos; flores blancas o de color blanco-liláceo, reunidas en inflorescencias turbinado-ovoides, largamente pediceladas. Planta halófila, originaria de nuestro país (Santiago del Estero, Córdoba, Catamarca, Tucumán y Santa Fé). Muy característica en los jumeales de Allenrolfea patagonica, donde suele crecer al abrigo de los arbustos de mayor porte apoyándose en los mismos para trepar."

Material has been misidentified and distributed in herbaria as Verbena sp. In all, 57 herbarium specimens and 5 mounted photographs, including type material, have been examined by me.

Citations: ARGENTINA: Catamarca: Lorentz & Hieronymus 494 [Macbride photos 17539] (It—photo, Kr—photo, N, N—photo, N—photo, W—photo), s.n. [Nov. 10, 1872; Herb. Osten 13001] (Ug). Córdoba: Hauman s.n. [Herb. Mus. Argent. Cienc. Nat. 23985] (N); Hieronymus 494 (W—281551), 675 (W—281552); Kuntze s.n. [Totoralejos, Nov. 1892] (N, W—701566); Kurtz 6760 (N); Ragonese 6271 [Herb. Inst.

Bot. S. Paulo 68549] (N); Ragonese & Piccinini 6049 [Herb. Inst. Bot. S. Paulo 69161] (N); Villafañe 7 (N, N, S). La Rioja: Castellanos s.n. [Los Llanos, El Retamo, Feb. 14, 1940; Herb. Mus. Argent. Cienc. Nat. 33895] (N). Mendoza: Covas 2107 (N), 18541 (N); Ruiz Leal 8839 (N), 8878 (N); Semper s.n. [Desagradero, 14--18.II.1944] (W--1933993), s.n. (Ca). San Luis: Ruiz Leal 9099 (N). Santiago del Estero: H. H. Bartlett 19759 (Ca--3494, Ca--772455, Mi, W--1858379, W--1904664, W--1907601); Kuntze s.n. [Prov. Santiago, Oct. 1892] (N, N); Lillo 6069 [Herb. Inst. Miguel Lillo 32010] (N); Luna Risso 51 (N), 1404 (N); Maldonado 322 (N); Sparre 427 (S); Venturi 5641 [Herb. Osten 20816] (E--960018, Gg--157953, Ug, W--1591476), 10300 (N, S); Wall & Sparre s.n. [Metero, 9/11/46] (Ew, Ew, Ew). Tucumán: Bailetti 345 [Herb. Inst. Miguel Lillo 32011] (N); Dinelli s.n. [Lules, April 10, 1912; Herb. Inst. Miguel Lillo 32009] (N); Monetti s.n. [Los Decimoas, May 28, 1913; Herb. Inst. Miguel Lillo 32012] (N, N); Venturi 484 [Herb. Inst. Miguel Lillo 32007] (N, S, W--1591219), 7696 [Herb. Osten 20853] (Ca--397872, Gg--166881, N, N, S, Ug, W--1441070).

LIPPIA SALVIAEFOLIA Cham., *Linnaea* 7: 227. 1832.

Synonymy: *Lippia polycephala* Briq., *Ann. Conserv. & Jard. Bot. Genève*. 7-8: 307--309. 1904. *Lippia polycephala* var. *aemilii* Briq., *Bull. Herb. Boiss.*, sér. 2, 4: 1155. 1904. *Lippia polycephala* var. *genuina* Briq., *Bull. Herb. Boiss.*, sér. 2, 4: 1155. 1904. *Lippia sidoides* Schau. ex Briq., *Ann. Conserv. & Jard. Bot. Genève*. 7-8: 307, in syn. 1904 [not *L. sidoides* Cham., 1832]. *Lippia organoides* Schau. ex Briq., *Ann. Conserv. & Jard. Bot. Genève*. 7-8: 307, in syn. 1904 [not *L. organoides* Humb., 1825, nor Humb. & Bonpl., 1840, nor Humb. & Kunth, 1843, nor H.B.K., 1818, nor Kunth, 1847]. *Lippia polycephala* var. *aemillii* Briq. apud Moldenke, *Lilloa* 8: 425, sphalm. 1942. *Lippia polycephala* var. *typica* Briq. ex Moldenke, *Résumé Suppl.* 5: 7, in syn. 1962. *Lippia organoides* var. *sampaionis* Hert. ex Moldenke, *Résumé Suppl.* 10: 6, in syn. 1964. *Lippia salviifolia* Cham. ex Moldenke, *Résumé Suppl.* 10: 6, in syn. 1964. *Lippia salviaeifolia* Cham. & Schl. ex Moldenke, *Résumé Suppl.* 11: 7, in syn. 1964.

Bibliography: Cham., *Linnaea* 7: 227. 1832; Steud., *Nom. Bot.*, ed. 2, 2: 54. 1840; D. Dietr., *Syn. Pl.* 3: 598. 1843; Walp., *Repert. Bot. Syst.* 4: 51. 1845; Schau. in A. DC., *Prodr.* 11: 576. 1847; Schau. in Mart., *Fl. Bras.* 9: 225. 1851; Hiern, *Vidensk. Meddel. Kjöbenh.* 1877-1878: 97. 1877; Jacks. in Hook. f. & Jacks., *Ind. Kew.* 2: 95. 1894; Briq. in Engl. & Prantl, *Nat. Pflanzenfam.* 4 (3a): 151. 1895; Kuntze, *Rev. Gen. Pl.* 3 (2): 253. 1898; Briq. in Chod. & Hassler, *Bull. Herb. Boiss.*, sér. 2, 4: 1155--1156. 1904; Briq. in Chod. & Hassler, *Pl. Hassler.* 2 (11): 491. 1904; Briq., *Ann. Conserv. & Jard. Bot. Genève*. 7-8: 307--309. 1904; Ha-

yek, Denkschr. Kaiser. Akad. Wiss. Math.-nat. 79 (1): 295. 1908;
 Prain, Ind. Kew. Suppl. 3: 104. 1908; Glaz., Bull. Soc. Bot.
 France 58, Mém. 3: 540. 1911; Moldenke, Lilloa 5: 427. 1940; Mol-
 denke, Suppl. List Invalid Names 6. 1941; Moldenke, Known Geogr.
 Distrib. Verbenac., [ed. 1], 37, 40, 41, 43, & 96. 1942; Moldenke,
 Alph. List Invalid Names 32. 1942; Moldenke, Lilloa 8: 425 (1942)
 and 10: 379 & 380. 1944; Moldenke, Alph. List Cit. 1: 27, 56, 90,
 121, 141, 201, 255, & 264. 1946; Moldenke, Lilloa 14: 45. 1948;
 H. N. & A. L. Moldenke, Pl. Life 2: 63. 1948; Moldenke, Alph. List
 Cit. 2: 362--364, 366--368, 413, 441, 457, 490, 534, 535, 550,
 551, & 553 (1948), 3: 689, 751, 815, 835, 837, 863, 923, & 935
 (1949), and 4: 998, 1081, & 1094. 1949; Moldenke, Known Geogr.
 Distrib. Verbenac., [ed. 2], 81, 97, 99, 105, 189, & 191. 1949;
 Moldenke, Phytologia 3: 287 & 289. 1950; F. C. Hoehne, Ind. Bibl.
 & Num. Pl. Col. Com. Rondon 349. 1951; Troncoso, Darwiniana 10:
 88--89. 1952; Moldenke, Résumé 94, 114, 117, 126, 316, & 462.
 1959; Troncoso, Darwiniana 12: 258--260 & 280. 1961; Moldenke,
 Résumé Suppl. 5: 6 & 7 (1962), 10: 6 (1964), 11: 7 (1964), and 12:
 10 & 11. 1965; Moldenke, Phytologia 12: 23, 39, 47, 152, 170, 172,
 179, 203, 253, 275, 310, 331, & 366. 1965.

Suffrutescent shrub, 0.8--2 m. tall; stems woody at the base;
 branches divaricate-ascending, the older ones with gray bark;
 branchlets virgate, tetragonal or subtetragonal, subpulverulent-
 glandulose and hirtellous-tomentose or densely pubescent-tomentu-
 lose with short antrorse hairs; upper internodes 3--8 cm. long;
 leaves decussate-opposite, rather small, short-petiolate, subpa-
 tent; petioles 5--8 mm. long, tomentulose; leaf-blades chartace-
 ous, elliptic-obconic or ovate-oblong, 3--5 cm. long, 1.3--2.5 cm.
 wide, gradually smaller upwards on the branchlets, penninerved,
 rugose, much smaller among the inflorescences, acute or apiculate
 to rather obtuse at the apex, closely and minutely crenulate along
 the margins and more convex at the midpoint, with teeth to 1 mm.
 high and 1--2 mm. apart, rounded at the base and attenuate into
 the petiole, gray-green and pubescent-hirtellous or tomentellous
 above, densely but loosely hirtellous-tomentose and canescent or
 canescent-tomentellous beneath; venation more or less impressed
 above, prominent and reticulate beneath; secondaries 7--9 per side,
 conspicuously transversely anastomosing; inflorescence subpulveru-
 lent-glandulose and hirtellous-tomentose, often forming an inter-
 rupted composite raceme with verticillate axillary flowers or a
 pyramidal leafy panicle with floriferous branchlets issuing from
 the lower leaf-axils; peduncles axillary, aggregate, 8--14 per
 leaf-axil, flaccid, short, filiform, 6--10 mm. long, surpassing
 only the uppermost leaves, patulous-reflexed, subtetragonal,
 densely tomentellous with antrorse hairs; heads tetraquetrous-
 subglobose, small, 5--7 mm. long, 5--6 mm. wide, grayish or
 greenish when dry, the lowermost surpassed by the subtending
 leaves, the upper equaling or surpassing the leaves; bractlets
 membranous, ovate or broadly ovate, 2--3 mm. long, acuminate at
 the apex, spreading, shorter than the corolla-tube, the apex
 folded and recurved, connate at the base, rather long-villosulous
 or villous on the keel and ciliate at the margins; flowers greenish

or yellowish when dry; calyx minute, campanulate, compressed, about 0.6 mm. long, bifid or subbilabiate, antrorsely pubescent on the outside, ciliate, the lobes very shortly 2-dentate or obscurely lobulate; corolla hypocrateriform, white or yellowish-white, greenish or yellow when dry, surpassing the calyx by 3--4 mm., pubescent on the outside, the tube exserted, gradually ampliate upwards, rather densely puberulous on the outside, the limb small, the lobes very unequal, 0.5--1 mm. long, the larger ones ovate-rounded or subquadrate, crenulate and crisped at the margins, the anterior one largest, obcordate, and about 1 mm. long; stamens and pistil normal for the genus; fruit not seen.

The type of this handsome species was collected by Friedrich Sellow in São Paulo, Brazil (Chamisso says merely "E Brasilia misit Sellowius"), and was deposited in the herbarium of the Botanisches Museum at Berlin, where it was photographed by Macbride as his type photograph number 17541, but is now destroyed. The type of L. polycephala was collected by Emil Hassler (no. 4624) on arid hills at Caacupé, Paraguay, on December 8, 1882, and is deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques at Geneva. The type of L. polycephala var. aemilii was gathered by Hassler (no. 6720) in the region of the upper Río Y-acá, Paraguay, in December, 1900, and is also deposited at Geneva -- an isotype was photographed by Macbride in the Berlin herbarium as his type photograph number 17533. The type of L. organoides var. sampaionis was collected by Wilhelm Gustav Herter (no. 456) in Minas Gerais, Brazil, and is deposited in the United States National Herbarium at Washington. The L. salviaefolia var. parvifolia Mart. is a synonym of L. gracilis Schau.

Schauer (1847) places the species in his Section Goniostachyum. Briquet (1904), in speaking of his L. polycephala, describes the leaf-venation as "triplici-penninervis" and comments that "Cette espèce est connue depuis longtemps du Brésil. Nous lui rapportons les provenances suivantes, représentées à l'herbier Delessert: Minas Geraes (Claussen, envoi de mars 1839, sans numero): Caxoeira do campo, Minas Geraes, apr. 1839 (Claussen no. 128, env. de janvier 1840): Serra do Frio, Minas Geraes (Vauthier no. 411, ann. 1833): prov. de Piahy (Gardner n. 2714, juill.--sept. 1839). Ces plantes ont été rapportées par Schauer, pour autant qu'il les connaissait, au L. sidoides Cham. Cette détermination est jusqu'à un certain point justifiée, parce que Chamisso a fait suivre (l. c.) la description princeps du L. sidoides de la description de trois autres plantes différentes rattachées par l'auteur au L. sidoides, ce qui rend son espèce peu claire. L'original de Sellow, sur lequel est basé le L. sidoides, se distingue facilement du L. polycephala par ses rameaux glabrescents, ses feuilles plus minces obtusément dentées, scabres à la face supérieure (indument velouté dans le L. polycephala), très cunéiformes à la base, ses capitules moins nombreux, brièvement pedunculés, etc. Jusqu'à ce que des formes intermédiaires soient venues combler la lacune existante entre les L. sidoides et L. polycephala -- formes que nous n'avons

pas encore rencontrées dans les herbiers -- nous devons considérer les L. sidoides et L. polycephala comme des espèces distinctes. D'autres échantillons provenant de Martius sont rattachés dans l'herbier De Candolle par Schauer au L. organoides Kunth, espèce qui, d'après la description de Kunth, s'en écarte par ses feuilles arrondies à la base, ses capitules dépassant à peine les pétioles, ses bractées pubescentes et ciliées, etc."

The flowers are described as "whitish-yellow" on F. C. Hoehne s.n. [Butantan, April 12, 1918] and as "white" on Brade 5744, Hassler 6720, Herb. Osten 18178, Herb. Serv. Florest. Est. S. Paulo 787, Mendes Magalhães 1887, Mosén 1526, Pickel 787 & s.n. [Itaporanga, Feb. 17, 1944], Riedel 1778, and Rojas 2517 & 2543.

The species has been found growing on campos and shrubby campos, high very stony campos and campo cerrado, among bushes, in open fields, along roads, and at the borders of woods, flowering from November to April and in September. Mosén says that it is frequent in dry places.

Schauer (1847 & 1851) cites unnumbered collections of Lund, Raben, Riedel, and Sellow from São Paulo, as well as Silva-Manso s.n. [Herb. Martius 1032] from Matto Grosso in the Berlin, Munich, and DeCandolle herbaria; Hayek (1908) cites Campos Novaes s.n. from Campinas (which may be the Campos Novaes 930 cited below); Glaziou (1911) cites his number 14157 as L. velutina; Troncoso (1961) cites an isotype of L. polycephala in the Leiden herbarium. The Kuntze s.n. [Velasco, 200 m., VII.92], cited below, may actually represent L. affinis Schau.

Material of L. salviaefolia has been misidentified and distributed in herbaria under the names L. affinis Schau., L. martiana Schau., L. pseudothea Schau., L. sidoides Cham., and L. velutina Schau. On the other hand, the Martius s.n. [Villa Nova da Rainha], distributed as L. salviaefolia, is actually L. grata Schau.

In all, 92 herbarium specimens and 13 mounted photographs, including type or phototype material of most of the names involved, have been examined by me.

Citations: BRAZIL: Matto Grosso: F. C. Hoehne Com. Rondon 2239 (N), 4744 (Sp); Silva-Manso 226 [Herb. Martius 1032] (Br), 1032 (Br). Minas Gerais: Glaziou 14157 (N, W--1706157); Herter 456 [Herb. Mus. Nac. Rio Jan. 14856] (W--1199584); Mendes Magalhães 1887 (W--2124207); Puttemans s.n. [Herb. Campos Novaes 545] (N, Sp--15681). São Paulo: Brade 5744 (N, N, S, Sp--6732); Campos Novaes 930 (W--389896); Eiten & Eiten 2565 (W--2445187); Hammar s.n. [Mogy-mirim, Feb. 11, 1902; Herb. Com. Geogr. & Geol. S. Paulo 5852] (N, Sp--15694); Heiner 388 (S); Hemmendorff 84 (S), 85 (N, S), 88 (S), s.n. [Santa Rita do Passa Quatro] (S); Herb. Com. Geogr. & Geol. S. Paulo 5851 (N, Sp--15686); Herb. Inst. Agron. S. Paulo 89 (N, Sp--7623); Herb. Mus. Paulista 1872 (N, Sp--15677); Herb. Richard s.n. [Sorocaba, 1844] (W--238077); F. C. Hoehne s.n.

[Butantan, April 12, 1918] (N, Sp--1782); W. Hoehne 240 (Mg, N), 340 (Wh, Wh), 2248 (Mg, N), 2384 (N), 2385 (N), s.n. [Caieiras, 25/1/1945] (Wh, Wh, Wh, Wh, Wh), s.n. [Caieiras, 22/8/1945] (Wh), s.n. [Alta da Lapa, 10/4/1946] (Wh, Wh, Wh, Wh, Wh, Wh); Mosén 1526 (S); Pickel 787 (Sf), 996 (Sf), 1294 (Sf), s.n. [Itaporanga, Feb. 14, 1944; Herb. Serv. Florest. Est. S. Paulo 787] (W--1564374), s.n. [Helvetia, Jan. 18, 1945; Herb. Serv. Florest. Est. S. Paulo 996] (W--1564392); Raben 508 (Br); L. Riedel 1778 (N); Sellow s.n. [Macbride photos 17541] (It--photo of type, Kr--photo of type, N--photo of type, N--photo of type, W--photo of type); Toledo s.n. [Rincão, Jan. 25, 1928] (N, Sp--24006); Usteri s.n. [Jundiaby, Jan. 27, 1907; Herb. Polytech. S. Paulo 258b] (N, Sp--15671); Viegas & Kiehl s.n. [29 Marco 1939; Herb. Inst. Agron. Est. S. Paulo 3900] (N), s.n. [Herb. Inst. Agron. Est. S. Paulo 3904] (W--1775596). State undetermined: Collector undesignated 211 (Sp--20069). BOLIVIA: Santa Cruz: Kuntze s.n. [Ost Velasco, VII.92] (N), s.n. [Velasco, 200 m., VII.92] (W--701991). PARAGUAY: Balansa 4624 (N); Fiebrig 4234 (Cb, Cb, V); Hassler 6720 [Macbride photos 17533] (Ca--944346, It--photo, Kr--photo, Mi, N, N, N--photo, S, S, W--photo); T. Rojas 2517 [Herb. Osten 18178] (N, N, Ug), 2543 [Herb. Osten 18174] (F--photo, N, N--photo, Sg--photo, Ug, Z--photo), ARGENTINA: Misiones: Quiroga 350 [Herb. Osten 7706] (Ug), s.n. [San Ignacio, March 15, 1914; Herb. Osten 7706] (S); D. Rodriguez 625 [Herb. Mus. Argent. Cienc. Nat. 23838; Herb. Inst. Miguel Lillo 32361] (Ca--3509, N, N, W--1802579); A. G. Schulz 7107 (Z).

LIPPIA SANDWITTHIANA Moldenke, Lilloa 5: 427--428. 1940.

Bibliography: Moldenke, Lilloa 5: 427--428. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 41 & 96. 1942; Moldenke, Alph. List Cit. 1: 264. 1946; Moldenke, Lilloa 14: 45--46. 1948; H. N. & A. L. Moldenke, Pl. Life 2: 31. 1948; Moldenke, Alph. List Cit. 4: 1165. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 99 & 191. 1949; E. J. Salisb., Ind. Kew. Suppl. 11: 138. 1953; Moldenke, Résumé 117 & 462. 1959.

Perennial herb, woody at the base; stems erect, few or numerous, slender, densely hirsute-hispidulous with white hairs to 2 mm. long, not much branched; leaves decussate-opposite, numerous, sessile, aromatic; leaf-blades firmly chartaceous and stiff, oblong or elliptic, 0.8--4 cm. long, 0.6--2.4 cm. wide, acute at the apex, rounded or cordate at the base, uniformly and regularly serrulate from the base to the apex with very numerous and small blunt teeth, hirsute-hispidulous on both surfaces, more densely so beneath, conspicuously bullate above; inflorescence axillary, shorter than the subtending leaves, sparse, solitary in the upper leaf-axils, decussate-opposite; peduncles very slender, hirsute-hispidulous like the adjacent branches, 5--8 mm. long; corolla hypocrateriform, yellow.

The type of this species was collected by Emil Hassler (no.

11031) in a calcareous region along the upper course of the Rio Apa, Paraguay, in March, 1913, and is deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques at Geneva. The species has been found on limestone campos and is said by Anisits to be "common" in limestone soil. It has been collected in anthesis in December, January, and March, and is named in honor and commemoration of Noël Yvri Sandwith, world-famous expert on American plants and most especially on the Bignoniaceae, whose recent death was an irreparable loss to the science of botany.

In all, 7 herbarium specimens, including the type, and 2 mounted photographs have been examined by me.

Citations: PARAGUAY: Anisits 2336 (S), 2517 (N, S); Hassler 11031 (Cb--type, K--isotype, N--isotype, N--isotype, N--photo of type, Z--photo of type).

LIPPIA SATUREIAEFOLIA Mart. & Schau. ex Schau. in A. DC., Prodr. 11: 586. 1847.

Bibliography: Schau. in A. DC., Prodr. 11: 586. 1847; Schau. in Mart., Fl. Bras. 9: 239. 1851; Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 96. 1894; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 151. 1895; Hayek in Engl., Bot. Jahrb. 42: 166. 1908; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 37 & 96 (1942) and [ed. 2], 81 & 191. 1949; Moldenke, Alph. List Cit. 3: 691 & 710. 1949; Moldenke, Résumé 94 & 462. 1959; Moldenke, Phytologia 12: 24. 1965.

Small shrub, to almost 1 m. tall, densely covered with shiny ferruginous glandular pulverulence; stems subsimple or few-branched above; lateral branchlets abbreviated; leaves small, decussate-opposite, crowded; leaf-blades lanceolate, 6--10 mm. long, 2 mm. wide, folded, obtuse at the apex, entire along the margins, attenuate at the base, 1-veined; peduncles very short; heads solitary in the uppermost leaf-axils, subglobose, equaling the subtending leaves and surrounded by them; bractlets concave, imbricate, ovate-elliptic, obtuse at the apex, villous along the margins, shorter than the corolla-tube; calyx bifid, glandulose, subvillous, the teeth obtuse; corolla hypocrateriform, 4 mm. long, pubescent on the outside, glandulose above, its tube rather straight, subcylindric, whitish, slightly ampliate above, the limb rose, the throat yellowish, the lobes rounded.

The type of this apparently very rare species was collected by Carl Friedrich Philipp von Martius (no. 1377) "in campis siccis editis districtus Serro Frio prov minarum ad Tejuco et Lavras da Pindaiba", Minas Gerais, Brazil, flowering in June, and is deposited in the Martius Herbarium at Munich, where it was photographed by Macbride as his type photograph number 20333. Schauer (1847) places the species in his Section Zapania, Subsection Axilliflorae. He says of it: "Species omni ratione perinsignis, inprimis vero indumento pulvereo-glanduloso, in planis Verbenaceis saepe occurrente et hinc inde in lepidis abeunte hic tamen maxime exculito sub microscopio vesiculas subglobosas basi affixas oleoque aromatico

repletas exhibente." Of its leaves he says "eoque modo complicata ut facies plane dispareat." The species is known to me only from what is stated of it in its literature and from 5 mounted phototypes which have been examined by me.

Citations: BRAZIL: Minas Gerais: Martius 1377 [Herb. Monac. 128; Macbride photos 20333] (It--photo of type, Kr--photo of type, N--photo of type, N--photo of type, W--photo of type).

LIPPIA SAVORYI Meikle, Kew Bull. 17: 173--174. 1963.

Synonymy: Lippia multiflora var. pubescens Moldenke, Phytologia 3: 271. 1950. Lippia africana var. sessilis Moldenke, Phytologia 3: 271. 1950. Lippia nigeriensis var. brevipedunculata Moldenke, Phytologia 3: 272--273. 1950. Lippia wilmsii var. sessilis (Moldenke) Moldenke, Phytologia 4: 179. 1953. Lippia adoensis sensu Hutch. & Dalz. apud Meikle, Kew Bull. 17: 173, in syn. 1963 [not L. adoensis Hochst., 1841].

Bibliography: Hutch. & Dalz., Fl. W. Trop. Afr. 2: 270. 1931; Moldenke, Phytologia 3: 271--273 (1950), 3: 455 & 456 (1951), and 4: 179. 1953; Moldenke, Biol. Abstr. 27: 1887 & 2026. 1953; Moldenke, Résumé 138, 142, 462, & 463. 1959; Moldenke, Résumé Suppl. 3: 33. 1962; Meikle, Kew Bull. 17: 173--174. 1963; Anon., Assoc. Etud. Tax. Fl. Afr. Trop. Index 1963: 60. 1964; Moldenke, Résumé Suppl. 11: 5 (1964) and 12: 5, 7, 10, & 11. 1965; Moldenke, Phytologia 12: 299--300 & 305--306. 1965.

Perennial woody herb, small shrub, or subshrub, erect, 0.5--2 m. tall, aromatic; stems subterete or more or less distinctly hexagonal, brown, scabridulous, sparsely or densely strigose-pubescent; branches densely strigose-pubescent; leaves sessile or subsessile, ternate or in whorls of 4--6, firm, rigid; petioles very short, densely strigose-pubescent; leaf-blades lanceolate or ovate to oblong-ovate or narrow-elliptic, 2.5--8 cm. long, 0.4--3 cm. wide, serrate along the margins, bullate and very scabrous above with more or less dense bulbous-based hairs and more or less scabrous-pilose, densely short-pilose beneath; venation conspicuously impressed above, the midrib and secondaries prominent beneath, the venation elegantly reticulate; inflorescence irregularly verticillate-spicate, unbranched, 1.5--3 cm. in all, equaling or slightly exceeding the subtending leaves; peduncles densely strigose-pubescent or white-villous; spikes often 2--4 per node, sometimes densely corymbose-glomerate at the apex of the inflorescence, ovoid or subcylindric, to 2 cm. long and 1.3 cm. wide, hard, short-pedunculate, the rachis densely white-villous; bractlets ovate-spatulate, about 4.5 mm. long and 3 mm. wide, acute or short-cuspidate at the apex, densely white-villous on the outside, glabrous on the inside, shiny; corolla hypocrateriform, to 4 mm. long, white or whitish to lemon-yellow or purplish, often yellowish in the throat, or the outer flowers cream-colored, the center green, distinctly pubescent on the outside; cocci navicular, about 2 mm. long and 1 mm. wide, long white-villous on the back.

The type of this species was collected by H. J. Savory [Herb. Univ. Coll. Ibadan 108] -- in whose honor it was named -- at Kurra

Falls on the Jos Plateau, Northern Nigeria, and is deposited in the herbarium of the Royal Botanic Gardens at Kew. The type of L. multiflora var. pubescens was collected by H. V. Lely (no. 241) at Naraguta, at an altitude of 4000 feet, Northern Nigeria, on May 30, 1921, also deposited at Kew; that of L. nigeriensis var. brevipedunculata was gathered by the same collector (no. P.40) in groups after fires at Banchi in January, 1929, also deposited at Kew; and that of L. africana var. sessilis was gathered by the same collector (no. 320) at Naraguta, on June 23, 1921, deposited at Kew.

According to Meikle (1963) this is the L. adoensis of Hutchinson & Dalziel (1931), in part. The true L. adoensis of Hochstetter is a synonym of L. abyssinica (Otto & Dietr.) Cuf. The flowers of L. savoryi are described as "purplish" on Lely 241, "lemon-yellow" on N. M. Pritchard 306, "white" on Barbosa & Moreno 10167 and C. Henriques 49, and "outer flowers cream-colored, center green" on Lely 320. The plant has been found growing on riverbanks and at altitudes of 1330 to 1875 meters, flowering in January and from May to July. A vernacular name recorded for it is "okwango" in the Congo.

Lippia multiflora var. pubescens and L. nigeriensis var. brevipedunculata were kept as valid by me earlier in this series of notes on the genus, but a re-examination of type material has convinced me that my friend Meikle is correct in his disposition of them.

Material of L. savoryi has been misidentified and distributed in herbaria under the names L. adoensis Hochst., L. asperifolia Rich., and L. scaberrima Sond.

This taxon differs from L. wilmsii in having its leaves firm and rigid, sessile or subsessile, in whorls of 3-6, often narrow-elliptic, 2.5-8 cm. long, 0.4-3 cm. wide, very scabrous and bullate above, and the inflorescences whorled in 4's, equaling or slightly surpassing the subtending leaves; from L. nigeriensis in having the leaves regularly whorled, 2.5-8 cm. long, 0.4-3 cm. wide, and bullate above, and the inflorescences unbranched and only 1.5-3 cm. long in all; from L. multiflora in its stems, branches, petioles, and peduncles being densely strigose-pubescent, and its leaf-blades more or less scabrous-pilose above and densely short-pubescent beneath.

Meikle (1963) cites the following specimens, presumably all in the Kew herbarium, in addition to the ones seen by me: NIGERIA: Northern: Batten-Poole 207 & 230; Coombe 21 & 112; Dalziel 177; Lely 69; McClintock 244; Meikle 1059 & 1344; Savory s.n. [Herb. Univ. Coll. Ibadan 108]. He states that the taxon has not been recorded from outside of Northern Nigeria, but this is erroneous -- it is known also through specimens from the Republic of Congo and from Angola.

In all, 10 herbarium specimens, including the types of most of

the names involved, and 12 mounted photographs have been examined by me.

Citations: NIGERIA: Northern: Lely 241 (F--photo, K, N, N--photo, Sg--photo, Z--photo), 320 (F--photo, K, N, N--photo, Sg--photo, Z--photo), P.40 (F--photo, K, N, N--photo, Sg--photo, Z--photo). CONGO LEOPOLDVILLE: Kevers 48 (Br). ANGOLA: Huila: Barbosa & Moreno 10167 (Ul); C. Henriques 49 (Ul); N. M. Pritchard 306 (Ul).

LIPPIA SCABERRIMA Sond., Linnaea 23: 87. 1850.

Synonymy: Camara salviaefolia β transvalensis Kuntze, Rev. Gen. Pl. 3 (2): 250. 1898. Lippia transvalensis (Kuntze) Moldenke, Phytologia 1: 428. 1940. Lantana salviifolia f. transvalensis Kuntze ex Moldenke, Suppl. List Invalid Names 4, in syn. 1941. Lippia transvaalensis (Kuntze) Moldenke, Alph. List Invalid Names Suppl. 1: 15, in syn. 1947. Camara salviifolia var. transvalensis Kuntze ex E. J. Salisb., Ind. Kew. Suppl. 10: 134, in syn. 1947.

Bibliography: Sond., Linnaea 23: 87. 1850; Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 96. 1894; Kuntze, Rev. Gen. Pl. 3 (2): 250. 1898; H. H. W. Pearson in Thiseit.-Dyer, Fl. Cap. 5: 194--195. 1901; H. H. W. Pearson, Trans. S. Afr. Phil. Soc. 15: 176. 1905; Moldenke, Phytologia 1: 428 (1940), 1: 504 (1941), and 2: 53. 1941; Moldenke, Suppl. List Invalid Names 2 & 4. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 52 & 96. 1942; Moldenke, Alph. List Invalid Names 12. 1942; E. J. Salisb., Ind. Kew. Suppl. 10: 134. 1947; Moldenke, Alph. List Invalid Names Suppl. 1: 12 & 15. 1947; Moldenke, Bol. Soc. Venez. Cienc. Nat. 11: 48. 1947; Moldenke, Alph. List Cit. 2: 628 (1948), 3: 659 (1949), and 4: 1140 & 1296. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 122 & 191. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 10. 1949; Moldenke, Phytologia 3: 77 (1949), 4: 73 (1952), and 5: 99. 1954; Moldenke, Inform. Mold. Set 49 Spec. 2 (1954) and 51 Spec. 3. 1956; Moldenke, Résumé 152, 154, 248, 307, 317, & 462. 1959; Moldenke, Résumé Suppl. 8: 4 & 5. 1964; Moldenke, Phytologia 12: 231, 232, 306, 344, & 358. 1965.

Perennial herb. low or small slightly spreading subshrub, or erect aromatic scabrid shrub, to almost 1 m. tall, more or less bushy, with several to many stems or branches from the rootstock; stems and branches tetragonal, striate, scabrid, glandulose; leaves decussate-opposite, aromatic, narrowly lanceolate or elliptic-lanceolate, 2.5--3.7 cm. long, 4--6 mm. wide, subacute at the apex, crenate-serrulate along the margins from about the middle to the apex, entire toward the base and narrowed into the very short petiole, scabrid on both surfaces, profusely punctate-glandular, 3-veined at the base, the margins scabrid, the primary veins impressed above and prominent beneath; spikes ovoid, solitary, to 12 mm. long, 4--10 mm. in diameter; peduncles striate, 2.5--5 cm. long, scabrid-puberulous; bractlets surpassing the flowers, broadly ovate, 4--10 mm. long, 3--6 mm. wide, greenish-yellow, short-cuspidate at the apex or sometimes rounded and ob-

tuse, entire and ciliate along the margins, glandular-puberulent or -pubescent, with parallel veins; calyx 2-lobed, compressed, mitre-shaped, $1/3$ — $1/2$ as long as the corolla, pubescent outside, glabrous within, the lobes acute, obtuse, or rounded at the apex, 0.5—1 mm. long; corolla hypocrateriform, white or cream to pale-cream colored, 3—4.5 mm. long, glandular-pubescent on both surfaces, the anterior lip broad, with a sinuate margin, rounded or subemarginate at the apex, larger than the broadly oblong posterior lip; ovary and style 2—3 mm. long; fruit smooth, semiglobose, 1.5—2 mm. long, glabrous.

The type of this species was collected by Carl Ludwig Philipp Zeyher (no. 1372) along the Sand River, Orange Free State, South Africa. The type of Camara salviaefolia β transvalensis was collected by Carl Ernst Otto Kuntze at Johannesburg, Transvaal, South Africa, and is deposited in the Britton Herbarium at the New York Botanical Garden.

The species has been found growing in sandy soil, on the veld, along roadsides, in sandy dry soil in Acacia thornveld, on rocky dolomite slopes, and in sandy open treeveld along with Combretum, Terminalia, and Acacia, at altitudes of 2000 to 6000 feet, flowering in February, April, and December, and fruiting in April. Vernacular names recorded for it are "Benke's bossie", "beukesbossie", and "mosukotswane". The Burke s.n. [Sand River, April] was distributed in herbaria as "Lippia sp. nov." F. A. Rogers 357 is a mixture with L. javanica (Burm. f.) Spreng.; Brueckner 439 is very immature and anomalous.

Badenhorst states that this species is used in the treatment of sore eyes and stomach troubles, and that it taints the milk of cows eating it. The corollas are described as "white" on Galpin M.753 and Rodin 3518, "cream" on Brueckner 439, and "white to pale cream-colored" on Meeuse 9453.

Pearson (1901) distinguishes this species from related South African ones as follows:

1. Calyx distinctly 2-lobed.
 2. Bractlets more than 4 mm. long and 3 mm. wide, surpassing the flowers.....L. scaberrima.
 - 2a. Bractlets less than 4 mm. long and 3 mm. wide, not surpassing the flowers.....L. javanica.
- 1a. Calyx truncate, subtruncate, or obscurely lobed.
 3. Leaf-blades serrate or crenate-serrate.
 4. Bractlets more than 4 mm. long; calyx truncate or obscurely 4-toothed.....L. wilmsii.
 - 4a. Bractlets less than 4 mm. long; calyx obscurely 2-lobed.....L. rehmanni.
 - 3a. Leaf-blades crenate.....L. pretoriensis.

Dr. Meeuse, however, in a letter to me dated December 9, 1953, says of Pearson's key: "His calyx-character (distinctly lobed or indistinctly lobed to truncate) is useless, to my mind, so that L. wilmsii cannot on very good grounds be separated from L. scaber-

rima." Pearson (1905) says that his L. pedunculata differs from L. scaberrima in having a 4-toothed calyx, smaller bractlets, more pronounced hairiness, and a comparatively smoother surface to the whole plant.

Material of L. scaberrima has been misidentified and distributed in herbaria as L. wilmsii H. H. W. Pearson; on the other hand, the C. Henriques 49, distributed as L. scaberrima, is actually L. savoryi Meikle, while Meeuse 9029 and Pott 5648 are L. wilmsii.

Pearson (1901) cites Zeyher 1372, Burke s.n. [Sand River], and Mrs. Bowker 665 from the Orange Free State; Holub s.n. [banks of the Vaal and Harts Rivers] from Cape of Good Hope; Holub s.n. [Barolong Territory] from Bechuanaland; and Gilfillan s.n. [Jeppes Town Ridges, Johannesburg, about 6000 ft.; Galpin 6246] from Transvaal.

In all, 38 herbarium specimens and 6 mounted photographs, including type material of all the names involved, have been examined by me.

Citations: BECHUANALAND PROTECTORATE: Rodin 3518 (Ca--802639, S, W--2962914). SOUTH AFRICA: Cape of Good Hope: Acock 8320 (N, S, S); Brueckner 439 (Cb); W. J. Foley s.n. [Herb. Nat. Mus. Pret. 2801] (Af); Herb. Mus. Bot. Stockholm s.n. (S); Holub s.n. [banks of Vaal and Harts rivers] (Af); Wahlberg s.n. [Goda Hopps Udden] (S). Natal: Haygarth s.n. [J. M. Wood 10790] (N--photo, Vt, Z--photo). Orange Free State: Barrett-Hamilton s.n. [1901--1902] (N); Burke s.n. [Sand River, April] (Ut--11485); A. Peter 50887 [S.35] (B); Zeyher 1372 (F--photo of type, N--isotype, N--photo of type, S--type, Si--photo of type, Z--photo of type). Transvaal: Badenhorst s.n. (Af); Barnard & Mogg 743 (Cb); M. Collins s.n. [I.1909] (Cb); R. A. Dyer 5448 (Z); E. E. Galpin M.753 (Af, Br); Gilfillan s.n. [Johannisburg; Sonder 6246] (Af); Herb. Patchelstroom Sch. Agr. 23 (Af); Kirges 1868 (Af); Kuntze s.n. [Johannisburg] (Br, N); R. Leendertz s.n. [3.X.1910] (S); B. A. M. Liebenberg 149 (Br); Lieuwenhertz 75 (Af), 149 (Af); Louis 501 (Af); Meeuse 9453 (Ss), 9475 (Ss); H. K. Munro PS.139 (Af); F. A. Rogers 357, in part (S); J. D. Sutton 88 (Af).

LIPPIA SCAPOSA Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1162--1163. 1904.

Bibliography: Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1162--1163. 1904; Briq. in Chod. & Hassler, Pl. Hassler. 2 (11): 498--499. 1904; Prain, Ind. Kew. Suppl. 3: 104. 1908; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 41 & 96. 1942; Moldenke, Alph. List Invalid Names 32. 1942; Moldenke, Lilloa 8: 425 (1942) and 10: 380. 1944; Moldenke, Alph. List Cit. 1: 264 (1946) and 2: 600. 1948; Moldenke, Lilloa 14: 46. 1948; Moldenke, Alph. List Cit. 3: 689 (1949) and 4: 1239. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 99 & 191. 1949; Moldenke, Ré-

sumé 117, 317, & 462. 1959; Troncoso, Darwiniana 12: 258 & 289. 1961; Troncoso, Bol. Soc. Argent. Bot. 9: 184. 1961; Moldenke, Phytologia 12: 24 & 84. 1965.

Medium-sized dioecious herb, to 0.6 m. tall; caudex hard, oblique or subhorizontal; stems and aerial branches green, erect, slender, tetragonal, shortly spreading-pilosulous at the base or glabrescent, strigose above with antrorse hairs; lower internodes 2--10 cm. long; scape 20--25 cm. tall; leaves small, decussate-opposite, few, sessile or subsessile, the lowest obovate, obtuse at the apex, the rest elliptic, acute at the apex, all constricted or broadly rounded at the base, entire or with 1 or 2 large teeth toward the apex, green on both surfaces, more or less roughened with antrorse strigose hairs, sometimes rather thick, the venation more or less prominent beneath; inflorescence terminal, paniculate, the axes all strigose with antrorse hairs; lower peduncles to 5 mm. long, the upper ones almost obsolete; heads small, hemispheric, 5--6 mm. long, finally ellipsoid and 7 mm. long, the lowest rarely borne in the axils of the small upper leaves and long-pedunculate, often in the axils of leaves which have been reduced to lanceolate bracts and which scarcely surpass the heads in length and separated by elongated internodes, or 3 collected at the apex of a very long naked scape; bractlets subovate- or elliptic-lanceolate, green, 4--4.5 mm. long, about 1 mm. wide, acute or short-acuminate at the apex, substrigose with antrorse hairs on the outside, shorter than the flowers; calyx campanulate, minute, less than 1 mm. long, pubescent toward the apex, obscurely bilabiate, repand-denticulate on the rim; corolla hypocrateriform, yellow, surpassing the calyx-mouth by 2.5 mm., the tube exserted, sometimes gradually ampliate from the cylindric base, puberulent toward the apex, the lobes very small, ovate or ovate-rounded, about 0.5 mm. long, the anterior one somewhat larger; stamens and pistil normal for the genus, included; the floral axis after anthesis 5 mm. long, villosulous-tuberculate; fruit not known.

The type of this species was collected by Emil Hassler (no. 6965) on a campo near Valensuela in the region of the upper course of the Río Y-acá, Paraguay, in January, 1900, and is deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques at Geneva; an isotype in the herbarium at the Botanisches Museum in Berlin was photographed by Macbride as his type photograph number 17542, but is now destroyed. The species has been found growing in fields and campos, flowering in January and March. Jorgensen describes it as "common in the campo". The original description is cited at the Instituto Miguel Lillo as "Plantae Hassleranae XI (1904) 498".

Briquet (1904) says "Cette gracieuse espèce appartient au groupe des Euzapania à inflorescence terminale. Elle s'écarte de toutes des espèces connues par l'exiguité de ses tiges aériennes, sa microphyllie, son indument, l'inflorescence, etc. etc." He describes the inflorescence as follows: "Capitula parva hemisphaerica, dein ellipsoidea, infima rarius in axillis parvis foliorum superioris longe pedunculata, saepius in axilla foliorum ad bracteas lanceo-

latas capitula haud superantes reductorum et internodiis elongatis separatis sita, nunc etiam tria in apice scapi longissimi nudi collocata."

Troncoso (1961) places the species in her Subgenus Lippia, Section Lippia, Series Paniculatae, along with L. angustifolia Cham. She cites, in addition, Hassler 6965 (Bm--isotype, Cb--type, Ml--isotype, P--isotype, X--isotype) and says "Especie dioica. El ejemplar tipo, Hassler 6965, aunque aparentemente hermafrodita es funcionalmente ♂, las flores caen sin ser fecundadas. Briquet en su descripción dice: 'mericarpia adhuc ignota', lo que confirma la opinión de que todo el ejemplar es ♂. Este autor describe, a continuación de la especie, una var. melanocaulos que difiere en: 'caulibus atris nec viridibus, superne ut videtur, magis fistulosis, bracteolis aliq. latioribus, magnis, ovatis. Hassler 6965a'. No he podido ver este ejemplar, pero por el carácter de la brácteas, ovales mayores y más anchas, podría tratarse de la planta ♀."

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BOOK REVIEW

Clyde F. Reed

"SPORES - FERNS, Microscopic illusions analysed." By Clara S. Hires, Vol. I: i-xxiv, 1-548, 246 plates, numerous text-figures. June, 1965. Mistaire Laboratories, 152 Glen Avenue, Millburn, New Jersey. 07041. \$22.50.

This is an excellent book, well written and beautifully illustrated, dealing with the theories and concepts of Miss Clara Hires in regard to the explanation of the microscopic illusions met with in the study of spores, ferns and fern-allies in particular. Miss Hires has spent much time and energy, as well as money, in projecting her analyses of three-dimensional concepts of trilete and monolete spores. This book illustrates in excellent fashion her use of models and diagrams as well as of actual photomicrographs of the spores themselves, and the various types of tetrad development in the various groups of the ferns and fern-allies.

The subject material in this book is presented in good form, and reflects its writers thinking very well. In my opinion it seems well-founded and the selection of illustrations seems sufficient and critical enough to stand verifying. This is an excellent presentation and a notable contribution to our present knowledge of the analysis of spore-formation and spore-evaluation. I highly recommend to any student of fern-spore morphology to read and study this book. Its scope is applicable to paleobotany as well as to present living forms.